

## Implementation evidence for Antenatal Optimisation

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These references provide evidence of that which has been shown to be successful in practice in implementing the various elements of the Antenatal Optimisation pathway and lists other resources to support implementation.

### Prediction of preterm birth

- Kenyon S, Hewison A, Dann SA, et al. The design and implementation of an obstetric triage system for unscheduled pregnancy related attendances: a mixed methods evaluation. *BMC Pregnancy Childbirth* 2017;17(1):309. doi: 10.1186/s12884-017-1503-5 [published Online First: 2017/09/20]
- Watson HA, Carlisle N, Kuhrt K, et al. EQUIPTT: The Evaluation of the QUIPP app for Triage and Transfer protocol for a cluster randomised trial to evaluate the impact of the QUIPP app on inappropriate management for threatened preterm labour. *BMC Pregnancy and Childbirth* 2019;19(1):68. doi: 10.1186/s12884-019-2210-1

### Guidelines for steroids, magnesium and antibiotics

- Liu G SJ, Gülmezoglu A, et al. Antenatal corticosteroids for management of preterm birth: a multi-country analysis of health system bottlenecks and potential solutions. *BMC Pregnancy Childbirth* 2015;15:S3. doi: 10.1186/1471-2393-15-S2-S3
- Lee HC, Lyndon A, Blumenfeld YJ, et al. Antenatal Steroid Administration for Premature Neonates in California. *Obstetrics & Gynecology* 2011;117(3):603-09. doi: 10.1097/AOG.0b013e31820c3c9b
- Lee SK, Beltempo M, McMillan DD, et al. Outcomes and care practices for preterm infants born at less than 33 weeks' gestation: a quality-improvement study. *Canadian Medical Association Journal* 2020;192(4):E81-E91. doi: 10.1503/cmaj.190940
- Chaillet N, Dubé E, Dugas M, et al. Evidence-Based Strategies for Implementing Guidelines in Obstetrics: A Systematic Review. *Obstetrics & Gynecology* 2006;108(5):1234-45. doi: 10.1097/01.AOG.0000236434.74160.8b
- Burhouse A, Lea C, Ray S, et al. Preventing cerebral palsy in preterm labour: a multiorganisational quality improvement approach to the adoption and spread of magnesium sulphate for neuroprotection. *BMJ Open Quality* 2017;6(2):e000189. doi: 10.1136/bmjoq-2017-000189
- Antenatal Corticosteroids Project: Ohio Perinatal Quality Collaborative <https://www.opqc.net/projects/OB-ANCS>
- Edwards K, Impey L. Extreme preterm birth in the right place: a quality improvement project. *Archives of Disease in Childhood - Fetal and Neonatal Edition* 2020;105(4):445-48. doi: 10.1136/archdischild-2019-317741
- Mc Goldrick EL, Crawford T, Brown JA, et al. Identifying the barriers and enablers in the implementation of the New Zealand and Australian Antenatal Corticosteroid Clinical Practice Guidelines. *BMC Health Services Research* 2016;16(1):617. doi: 10.1186/s12913-016-1858-8
- Narayanan S KA, Shetty N, Coker M. Case Study: NNAP – improving magnesium sulphate uptake. In: Programme NNA, ed. NNAP Case Studies. <https://www.rcpch.ac.uk/resources/think-magnesium-multidisciplinary-approach-improve-magnesium-sulphate-uptake-case-study>, 2018.

- Lee SK, Shah PS, Singhal N, et al. Association of a quality improvement program with neonatal outcomes in extremely preterm infants: a prospective cohort study. *Canadian Medical Association Journal* 2014;186(13):E485-E94. doi: 10.1503/cmaj.140399
- Binder S, Hill K, Meinzen-Derr J, et al. Increasing VLBW Deliveries at Subspecialty Perinatal Centers via Perinatal Outreach. *Pediatrics* 2011;127(3):487-93. doi: 10.1542/peds.2010-1064

#### National or regional processes that incentivise, educate, train and support

- NNAP Online. National Neonatal Audit Programme: Royal College for Paediatrics and Child Health; [Available from: <https://nnap.rcpch.ac.uk>]
- Lee SK, Beltempo M, McMillan DD, et al. Outcomes and care practices for preterm infants born at less than 33 weeks' gestation: a quality-improvement study. *Canadian Medical Association Journal* 2020;192(4):E81-E91. doi: 10.1503/cmaj.190940
- Burhouse A, Lea C, Ray S, et al. Preventing cerebral palsy in preterm labour: a multiorganisational quality improvement approach to the adoption and spread of magnesium sulphate for neuroprotection. *BMJ Open Quality* 2017;6(2):e000189. doi: 10.1136/bmj-2017-000189
- Edwards K, Impey L. Extreme preterm birth in the right place: a quality improvement project. *Archives of Disease in Childhood - Fetal and Neonatal Edition* 2020;105(4):445-48. doi: 10.1136/archdischild-2019-317741
- Langham E ND, East of England Neonatal Operational Delivery Network (ODN). Improving the rate of babies born at less than 27 weeks gestation in a maternity unit with a NICU on site. In: RCPCH, ed. RCPCH QI Central. <https://www.qicentral.org.uk/safety/safety-culture/improving-rate-babies-born-less-27-weeks-gestation-maternity-unit-nicu-site>.
- Maternity Incentive Scheme, Clinical Negligence Scheme for Trusts, NHS Resolution [Available from: <https://resolution.nhs.uk/wp-content/uploads/2020/02/Maternity-incentive-scheme-year-three-changes-to-safety-actions.pdf>].

#### Local, regional or national processes that support quality improvement, leadership, Cross disciplinary engagement and parent involvement

- Liu G SJ, Gülmezoglu A, et al. Antenatal corticosteroids for management of preterm birth: a multi-country analysis of health system bottlenecks and potential solutions. *BMC Pregnancy Childbirth* 2015;15:S3. doi: 10.1186/1471-2393-15-S2-S3
- Lee SK, Beltempo M, McMillan DD, et al. Outcomes and care practices for preterm infants born at less than 33 weeks' gestation: a quality-improvement study. *Canadian Medical Association Journal* 2020;192(4):E81-E91. doi: 10.1503/cmaj.190940
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- Narayanan S KA, Shetty N, Coker M. Case Study: NNAP – improving magnesium sulphate uptake. In: Programme NNA, ed. NNAP Case Studies. <https://www.rcpch.ac.uk/resources/think-magnesium-multidisciplinary-approach-improve-magnesium-sulphate-uptake-case-study>, 2018.
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- Langham E ND, East of England Neonatal Operational Delivery Network (ODN). Improving the rate of babies born at less than 27 weeks gestation in a maternity unit with a NICU on site. In: RCPCH, ed. RCPCH QI Central. <https://www.qicentral.org.uk/safety/safety-culture/improving-rate-babies-born-less-27-weeks-gestation-maternity-unit-nicu-site>.
- De Silva DA, Synnes AR, von Dadelszen P, et al. MAGnesium sulphate for fetal neuroprotection to prevent Cerebral Palsy (MAG-CP)—implementation of a national guideline in Canada. *Implementation Science* 2018;13(1):8. doi: 10.1186/s13012-017-0702-9
- Smith J, Gupta S, Williams E, et al. Providing antenatal corticosteroids for preterm birth: a quality improvement initiative in Cambodia and the Philippines. *International Journal for Quality in Health Care* 2017;28(6):682-88. doi: 10.1093/intqhc/mzw095

#### Network level arrangements for in utero transfer to optimise place of birth

- Edwards K, Impey L. Extreme preterm birth in the right place: a quality improvement project. *Archives of Disease in Childhood - Fetal and Neonatal Edition* 2020;105(4):445-48. doi: 10.1136/archdischild-2019-317741
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- Langham E ND, East of England Neonatal Operational Delivery Network (ODN). Improving the rate of babies born at less than 27 weeks gestation in a maternity unit with a NICU on site. In: RCPCH, ed. RCPCH QI Central.
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- Lui K, Abdel-Latif ME, Allgood CL, et al. Improved Outcomes of Extremely Premature Outborn Infants: Effects of Strategic Changes in Perinatal and Retrieval Services. *Pediatrics* 2006;118(5):2076-83. doi: 10.1542/peds.2006-1540

#### Network level responsibility for standardising care, sharing performance data and exception reporting

- Lee HC, Lyndon A, Blumenfeld YJ, et al. Antenatal Steroid Administration for Premature Neonates in California. *Obstetrics & Gynecology* 2011;117(3):603-09. doi: 10.1097/AOG.0b013e31820c3c9b

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- Helenius K, Gissler M, Lehtonen L. Trends in centralization of very preterm deliveries and neonatal survival in Finland in 1987-2017. *Transl Pediatr* 2019;8(3):227-32. doi: 10.21037/tp.2019.07.05 [published Online First: 2019/08/16]
- Wirtschafter DD, Danielsen BH, Main EK, et al. Promoting antenatal steroid use for fetal maturation: Results from the California Perinatal Quality Care Collaborative. *The Journal of Pediatrics* 2006;148(5):606-12.e1. doi: 10.1016/j.jpeds.2005.12.058
- Profit J, Goldstein BA, Tamaresis J, et al. Regional Variation in Antenatal Corticosteroid Use: A Network-Level Quality Improvement Study. *Pediatrics* 2015;135(2):e397-e404. doi: 10.1542/peds.2014-2177
- Kaplan HC, Sherman SN, Cleveland C, et al. Reliable implementation of evidence: a qualitative study of antenatal corticosteroid administration in Ohio hospitals. *BMJ Quality & Safety* 2016;25(3):173-81. doi: 10.1136/bmjqs-2015-003984

### Organisations and resources supporting or incentivising quality improvement in Antenatal Optimisation

- [Maternity and Neonatal Safety Improvement Programme, NHS England](#)
- [Preterm Perinatal Wellbeing Package, MCQIC-SPSP](#)
- [NNAP Online](#)
- [Saving Babies' Lives Version 2, NHS England](#)
- [NICE Adoption Support resource for Placental Growth Factor](#)
- [Maternity Incentive Scheme, Clinical Negligence Scheme for Trusts, NHS Resolution](#)
- [PRCePT](#)
- [PERIPrem care bundle, West of England Academic Health Sciences Network](#)
- [European Standards of Care for Newborn Health](#)
- [Bliss Baby Charter](#)