**Roehr C et a. ETR III Neonatology 2021**

**Supplement 2:** CROSS CUTTING SKILLS AND TOPICS in Neonatology

Trainee neonatologists should acquire detailed knowledge of the below cross cutting skills:

*2.1 Epidemiology and statistics:* Mortality and morbidity rates in the perinatal period and factors which influencemortality and morbidity. Methods of data collection at national and local level, including birth and death notification systems and audits aimed at quality assessment. Statistical methods applied to biomedical science allowing to analyse epidemiological information, and design and evaluate scientific information.

*2.2. Pathophysiology of the foetus:* Fetal growth and development and the means of its assessment.Impact of the major diseases of pregnancy on the foetus, e.g. hypertensive disease, maternal medical conditions, ante partum haemorrhage, and preterm labour. Detection of fetal anomalies and collaborative prenatal counselling. Evidence-based perinatal therapies for known foetal conditions and improving outcomes of, for example, preterm birth.

*2.3 Physiology of postnatal adaptation:* Respiratory, cardiovascular and other physiological changesat birth, also in the context of potential interventions. Development of organ systems and physiological changes after birth. Physiology of breast feeding.

*2.4 Pathophysiology of prematurity:* Respiratory development and pathology including surfactantdeficiency and its sequelae. Cardiovascular problems including recognition and treatment of patent ductus arteriosus or persisting pulmonary hypertension. Gastrointestinal development and feeding, renal maturation and fluid balance; pathogenesis of and risk factors for necrotising enterocolitis. Neurological problems, including pathogenesis of intraventricular haemorrhage and periventricular leucomalacia.

*2.5. Pathophysiology of conditions encountered in premature and mature infants:* Congenitalabnormalities and their management. Perinatal hypoxia and consequences of hypoxia and ischemia. Metabolic adaptation to postnatal life. Inborn errors of metabolism including screening programmes for their detection. Neonatal immunity and pathogenesis of perinatal / neonatal infection.

*2.6. Pharmacology in the perinatal/neonatal period:* Pharmacokinetics in the term and pretermnewborn, drug toxicity and interactions. Influence of maternal medication on neonatal condition, effects of maternal drug abuse on the foetus and newborn infant, and transmission of drugs via breast milk.

*2.7. Principles of neonatal care:* Theory and organisation of resuscitation/stabilisation based on the up-to-date European Resuscitation Council (ERC) / International Liaison Committee on Resuscitation (ILCOR) guidelines. Delivery room set-up following and debriefing following the Delivery Room Intensive Care Unit (DRICU) concept. Conceptual and interpretation of SpO2 and heart rate monitoring using pulse oximetry according to timing after birth. Individual titration of the inspired fraction of oxygen (FiO2) according to the SpO2 nomogram for term and preterm infants. Principles of non-invasive ventilation in the delivery room (DR). Drug management in the DR. Ethical aspects of resuscitation. Respiratory care, including adequate provision of ongoing non-invasive respiratory support andmechanical ventilation, endotracheal intubation and delivery of respiratory support. Management of complications and long-term sequelae of prolonged neonatal ventilation. Management of hyperbilirubinaemia, including indication for, and how to set up, an exchange transfusion. Cardiovascular support, assessment of cardiovascular system including need assessment for addressing treatment of a patent arterial duct. Postnatal growth, breast feeding, role of milk banks in the NICU, composition and use of dietetic formulae and supplements. Assessment of fluid balance and nutritional requirements, provision of adequate nutrition and monitoring of postnatal growth, primary promotion of breastfeeding, provision of own mother’s and donor milk, fortification, composition of dietetic formulae. Parenteral nutrition, prescription, administration and indications.

Assessment, diagnosis and management of severe enteral diseases. Neonatal skin and thermal care. Assessment of fluid balance and nutritional requirements. Assessment of bone mineralisation. Assessment of structural and functional integrity of the brain using clinical examination and special investigations. Prognosis of major neuropathology, screening preterm and 'at risk' babies for retinopathy and hearing loss. Diagnosis and assessment of congenital abnormality and dysmorphology. Investigation of suspected inborn errors of metabolism. Use of genetic investigations and diagnostic aids.

Routine care of the newborn in relation to jaundice, breast feeding, infections. Screening for neonatal disease by examination and investigation. Early, medium term and late sequelae of neonatal and perinatal events and ethical issues in neonatal care.

*2.8. Follow-up of high-risk infants:* Outcomes associated with perinatal high-risk groups (e.g.prematurity, fetal growth restriction and intrapartum hypoxia), diagnosis and counselling associated with cerebral palsy, visual and hearing defects, chronic respiratory problems and an understanding of the importance of other neurocognitive outcomes.

*2.9. Ethical issues and legal problems:* including National and European practice