

Appendix 1 – Major issues concerning SARS-CoV-2 in the neonate born from mother with SARS-CoV-2 infection

Delivery Room Management		Articles and guidelines
Umbilical cord clamping (early versus delayed cord clamping)	Given a lack of evidence to the contrary, delayed cord clamping is still recommended , provided there are no other contraindications.	WHO guidelines ¹ Obstetrician and Gynaecologists UK guidelines ² Pregnancy and Labour Portuguese guidelines ³
	The baby can be cleaned and dried as normal, while the cord is still intact.	Obstetrician and Gynaecologists UK guidelines ²
	Early umbilical cord clamping is recommended with the aim of reducing the possibility of infection.	Neonatal Portuguese guidelines ⁴
	If the mother has suspected SARS-CoV-2 infection and the isolation of both the mother and the newborn is adequate, late cord clamping could be done , although pros and cons should be analysed individually.	Neonatal Spanish guidelines ⁵
Skin-to-skin contact	If the mother has suspected or confirmed SARS-CoV-2 and if the baby is well and does not require care in the neonatal unit, skin-to-skin contact can be done, although the pros and cons should be analysed individually.	Obstetrician and Gynaecologists UK guidelines ² , Neonatal Spanish guidelines ⁵ , American neonatal guidelines ⁶
	If the mother also requests skin-to-skin contact with her infant she should comply with strict preventive precautions.	Pregnancy and Labour and Neonatal Portuguese guidelines ^{3,4}
Neonatal management		
Guidelines are consensual in implementing contact and droplet isolation measures , limiting contacts and clinical and laboratory monitoring of newborns of SARS-CoV-2 suspected or infected mothers.		Neonatal Portuguese ⁴ , Spanish ⁵ , American neonatal guidelines ⁶ and UK guidelines ⁷
Breastfeeding		
It is not yet clear whether SARS-CoV-2 can be transmitted via breast milk. Current guidelines recommend breastfeeding in asymptomatic or mild symptomatic infected mothers while ensuring contact and droplet isolation measures. Mechanical extraction of breast milk and administration to the newborn by a healthy caregiver can be an alternative, ensuring preventive isolation measures.		Neonatal Portuguese ⁴ , Neonatal Spanish ⁵ , American neonatal guidelines ⁶ , Pediatrics UK ⁷ and Italian ⁸ guidelines
Treatment		
Until now there is no specific treatment for neonatal SARS-CoV-2 infection. The main goal of treatment should be support measures. Inappropriate use of antibiotics should be avoided.		Neonatal Spanish ⁵ , Pediatrics UK ⁷ and Neonatal Portuguese ⁴ guidelines
Antiviral drugs	Lopinavir/Ritonavir is only recommended in neonates with ≥ 14 days and after 42 weeks gestational age. Appropriate dosage in preterm infants and neonates < 14 days of age are not known and toxicity in premature infants can be severe. FDA strongly recommends that this drug should be avoided in this age group.	Pediatrics Portuguese guidelines ⁹ , Pediatrics Spanish guidelines ¹⁰ , FDA ¹¹

	Consider using oseltamivir until influenza virus infection is excluded.	Pediatrics Portuguese guidelines ⁹
	Some guidelines suggest the use of chloroquine and hydroxychloroquine to treat SARS-CoV-2 infection in children but there is insufficient information about dosages and toxicity in the neonatal period.	Pediatrics Portuguese guidelines ⁹ , Pediatrics Spanish guidelines ¹⁰
	Some guidelines suggest the use of remdesivir to treat SARS-CoV-2 infection in children, especially in critically ill patients with mechanical ventilation, but there is insufficient information about dosages and toxicity in the neonatal period.	Pediatrics Portuguese guidelines ⁹ , Pediatrics Spanish guidelines ¹⁰
Clinical signs in neonates born from mothers with SARS-CoV-2 infection		
No clinical symptoms (n = 9), prematurity (n = 4), low birthweight (n = 1) – total 9 newborns.		Chen HJ, et al. ¹²
Shortness of breath (n = 6), fever (n = 2), increased heart rate (n = 1), vomiting/ feeding intolerance (n = 1), refusing milk (n = 1) and gastric bleeding (n = 2), prematurity (n = 6), disseminated intravascular coagulation (n = 2), refractory shock, multiple organ failure and death (n = 1) – total 10 newborns.		Zhu H, et al. ¹³
Pneumonia (n = 3, all newborns with SARS-CoV-2 identified), lethargy and fever (n = 1 newborn with SARS-CoV-2 identified), lethargy, vomiting, and fever (n = 1 other newborn with SARS-CoV-2 identified), respiratory distress syndrome, shortness of breath, cyanosis and feeding intolerance (n = 1 the third newborn with SARS-CoV-2 identified) – total 33 newborns.		Zeng L, et al. ¹⁴
Feeding intolerance – total 1 newborn.		Wang S, et al. ¹⁵
SARS-CoV-2 PCR screening in neonates born from mothers with SARS-CoV-2 infection		
Samples collected from amniotic fluid, cord blood and neonatal throat swab were negative (n = 6) – total 9 newborns.		Chen HJ, et al. ¹²
All samples from neonatal throat swab were negative (n = 9) – total 10 newborns.		Zhu H, et al. ¹³
3 samples from nasopharyngeal and anal swabs were positive on days 2 and 4 – total 33 newborns.		Zeng L, et al. ¹⁴
Positive pharyngeal swab at 36 hours after birth. Negative cord blood, placenta and breastmilk specimens – 1 newborn.		Wang S, et al. ¹⁵
Other laboratory test findings in neonates		
Positive IgM antibodies to SARS-CoV-2 (2 hours after birth) – 1 newborn.		Dong L, et al. ¹⁶
Mild increase in myocardial enzymes (n = 1) – total 9 newborns.		Chen HJ, et al. ¹²
Thrombocytopenia complicated with abnormal liver function (n = 2) – total 10 newborns.		Zhu H, et al. ¹³
Leukocytosis, lymphocytopenia and elevated creatine kinase-MB fraction (n = 1), increased procalcitonin without other changes (n = 1), suspected sepsis, with an Enterobacter positive blood culture, leukocytosis, thrombocytopenia and coagulopathy (n = 1), normal laboratory test results (n = 30) – total 33 newborns.		Zeng L, et al. ¹⁴
Lymphopenia, increased aminotransferase, increased total bilirubin and elevated creatine kinase – total 1 newborn.		Wang S, et al. ¹⁵
Chest radiographic image		
Infections (n = 4), neonatal respiratory distress (n = 2), pneumothorax (n = 1), normal (n = 3) – total 10 newborns		Zhu H, et al. ¹³
Nonspecific findings (n = 30), pneumonia (n = 2), neonatal respiratory distress and pneumonia (n = 1) – total 33 newborns.		Zeng L, et al. ¹⁴
Thickened lung texture (n = 1) – total 1 newborn.		Wang S, et al. ¹⁵

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