



COVID-19 and Neonatal Management in the Delivery Room

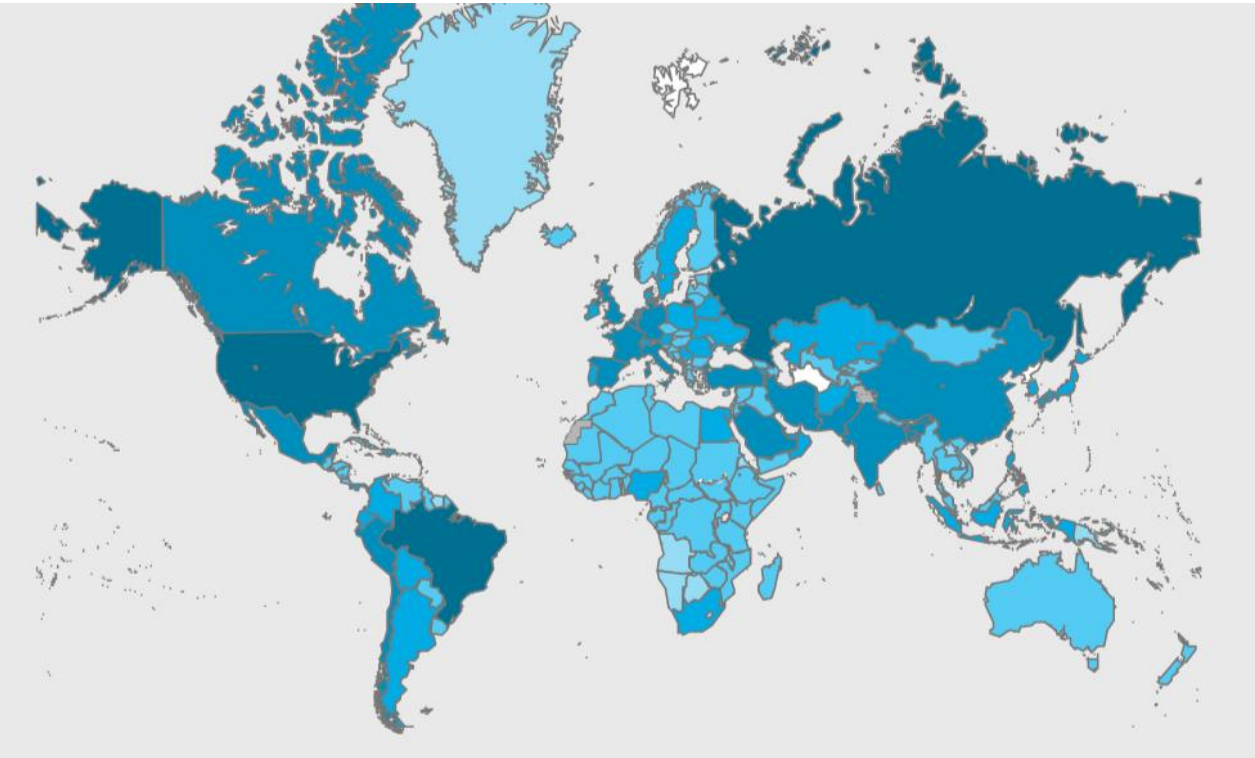
June 11th, 2020

**Brazilian Neonatal Resuscitation Program
Brazilian Society of Pediatrics**

Co-chairs: Maria Fernanda Branco de Almeida & Ruth Guinsburg

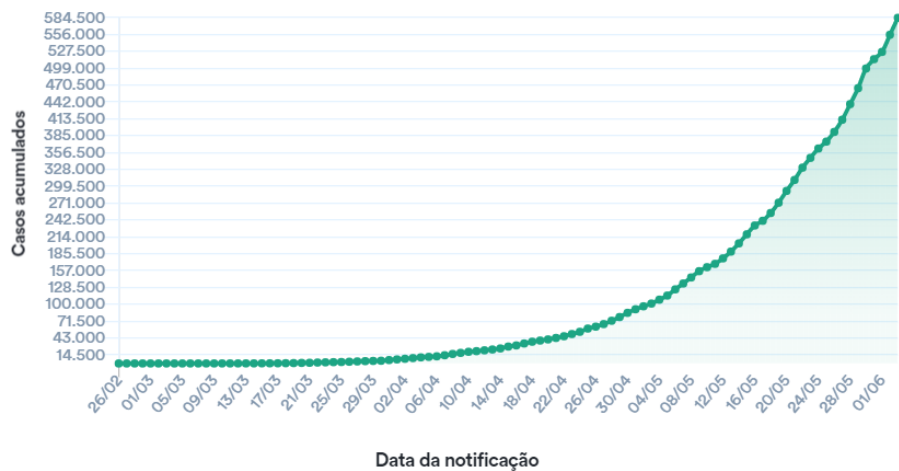
www.sbp.com.br/reanimacao

Globally, as of 4 June 2020, there have been 6,397,294 confirmed cases of COVID-19, including 383,872 deaths (<https://covid19.who.int/>)

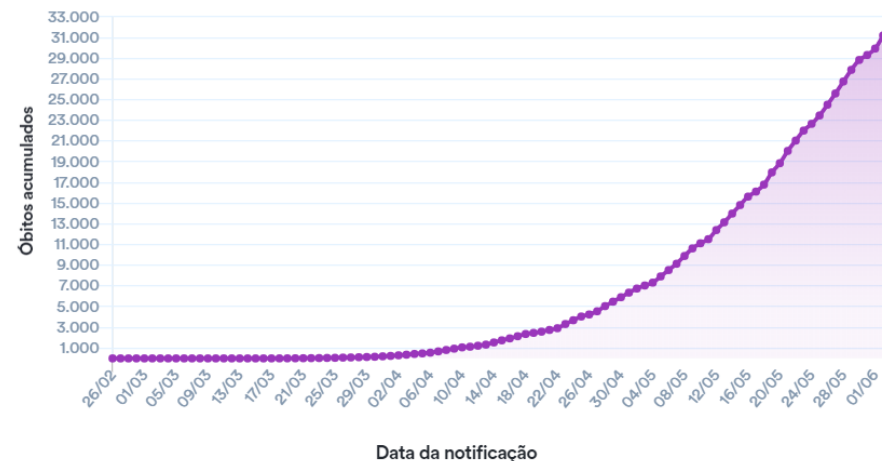


COVID-19 OFFICIAL DATA IN BRAZIL (<https://covid.saude.gov.br/>)

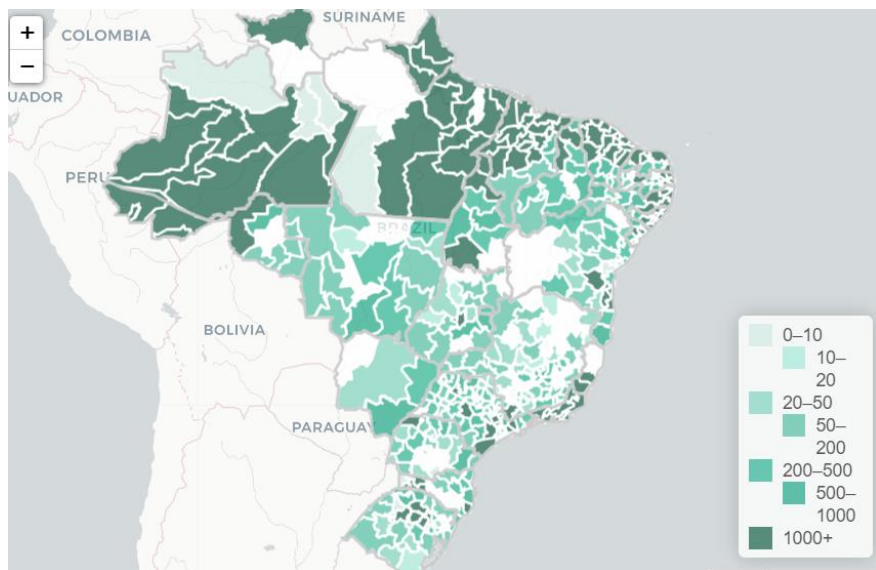
Cumulative cases of Covid-19 by date of notification



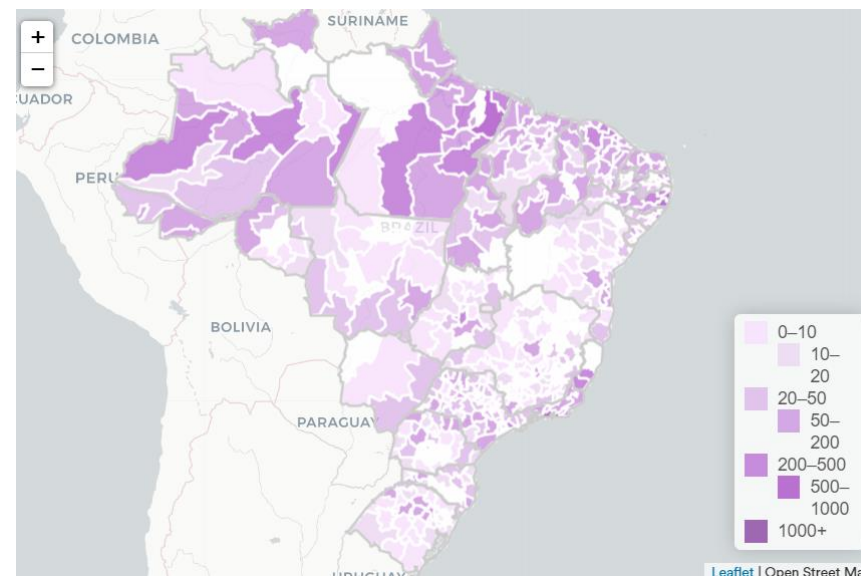
Cumulative deaths by Covid-19 by date of notification



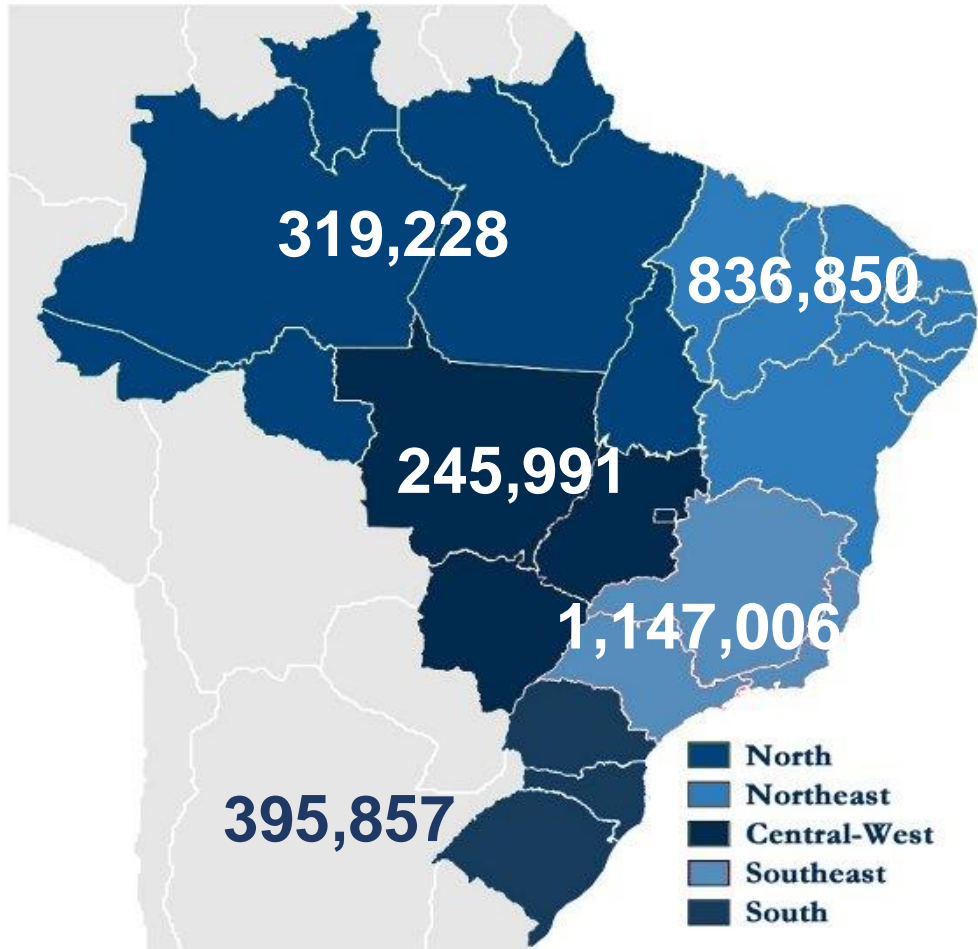
Coefficient of Incidence (per 100,000) by health district



Death Coefficient (per 100,000) by health district



BIRTHS IN BRAZIL - 2018



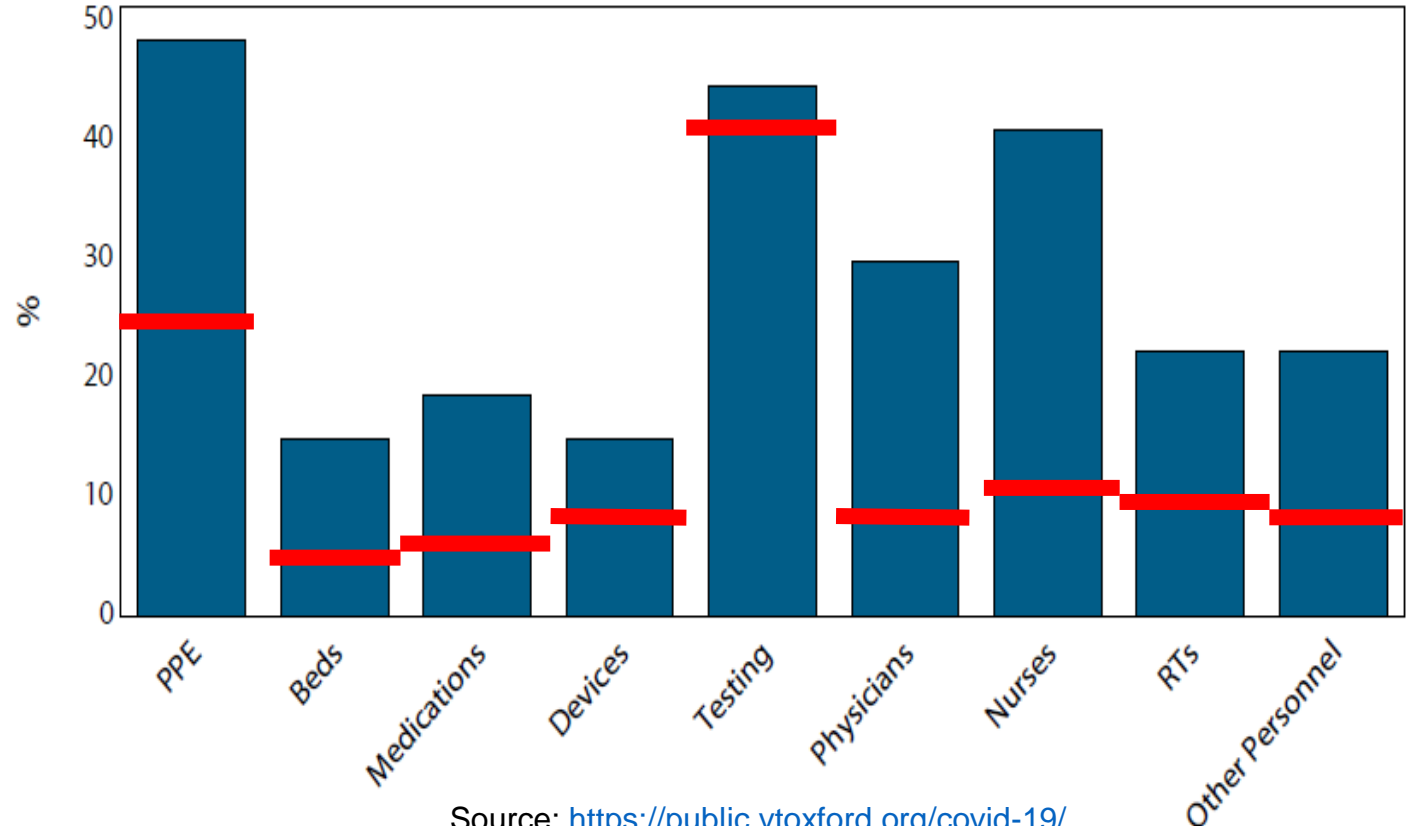
98% of Brazilian births are hospital births

VON SONPM COVID-19 Impact Audit April 2020



434 hospitals in 24 countries
34 leading hospitals in Brazil

Proportion of hospitals reporting shortages



Source: <https://public.vtoxford.org/covid-19/>

In a huge country, with heterogeneous health indicators, heterogeneous health care, heterogeneous impact of Covid-19 in terms of incidence, mortality and health resources, and in face of the high weight of perinatal asphyxia in neonatal mortality, there was a need to offer guidance to health professionals in charge of neonatal care at birth



03 de abril de 2020
atualização 07 de maio de 2020

Nota de Alerta

PROGRAMA DE REANIMAÇÃO NEONATAL

Recomendações para Assistência ao Recém-Nascido na sala de parto de mãe com COVID-19 suspeita ou confirmada – Atualização 2 –

Grupo Executivo do Programa Nacional de Reanimação Neonatal
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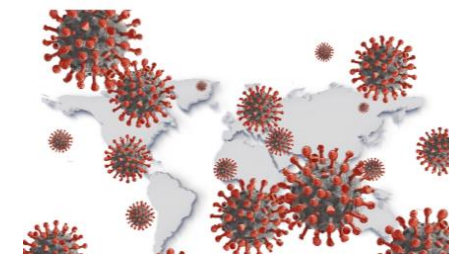
Introdução
O conhecimento sobre a COVID-19, a infecção pelo novo coronavírus SARS-CoV-2, vem aumentando rapidamente à medida que a pandemia se alastra e o número de casos cresce de forma exponencial em nível global. A preocupação com a infecção na gestação e suas repercussões para a gestante e para o concepto é grande e as evidências científicas sobre o comportamento da infecção nesse grupo ainda são esparsas.

Source: <https://www.todamateria.com.br/diversidade-cultural/>

- ✓ **The concern with infection during pregnancy and its consequences is great, but the scientific evidence on the behavior of infection in this group is sparse**
- ✓ **The existing evidence suggest that the main route of transmission of SARS-Cov-2 to the newborn is horizontal, by droplets from infected caregivers or by contact with contaminated biological material**
- ✓ **Case reports indicate that mother-to-child vertical transmission is possible, but not frequent. Possible explanation relates maternal viremia and viral placental tropism:**
 - **Viral RNA in the maternal blood does exist, but at low levels, and its ability to transmit infection is uncertain**
 - **Placental tropism of the virus seems to be low. ACE2 receptor is present at very low levels in the human placenta during 1st trimester of pregnancy. However, in rats, it increases its expression in late gestation**

The concern in assisting the newborn whose mother has suspected or confirmed COVID-19 is aimed mainly at:

- ✓ **1) Avoid infection of the newborn after birth**
- ✓ **2) Avoid infection by health professionals in the DR**



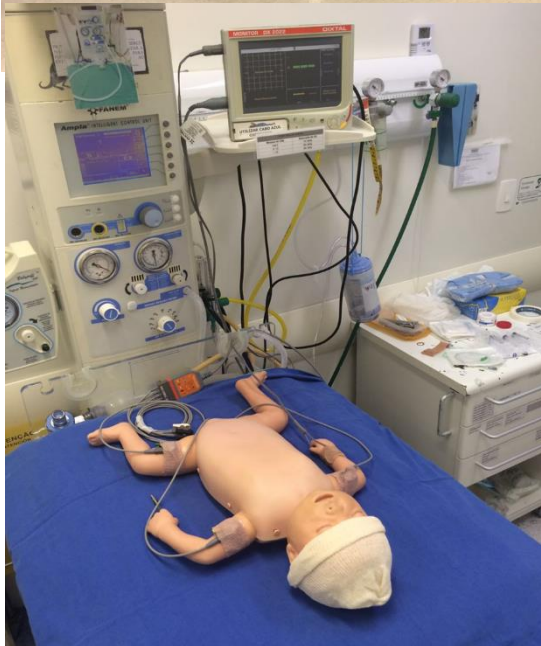
**COVID-19
NEONATAL GUIDELINES AND
SCIENTIFIC PUBLICATIONS**

<https://redeneonatal.com.br/>



PREPARING FOR NEONATAL CARE WITH SIMULATION

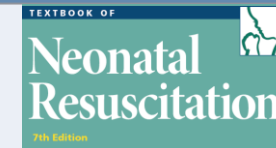
- ✓ The multiprofessional team responsible for the maternal and neonatal care should receive training in a simulated environment to ensure that the COVID-19 guidelines are followed
- ✓ Special emphasis should be given to training in donning and doffing, which are the situations with more frequent mistakes that lead to contamination of health professionals
- ✓ There is no need for technological or high-cost training resources, which can be done with the “in situ” methodology. Spending on PPE in the simulation will be offset by decreasing the risk of contamination by healthcare professionals during actual care
- ✓ **Periodic and regular repetition of training is recommended**

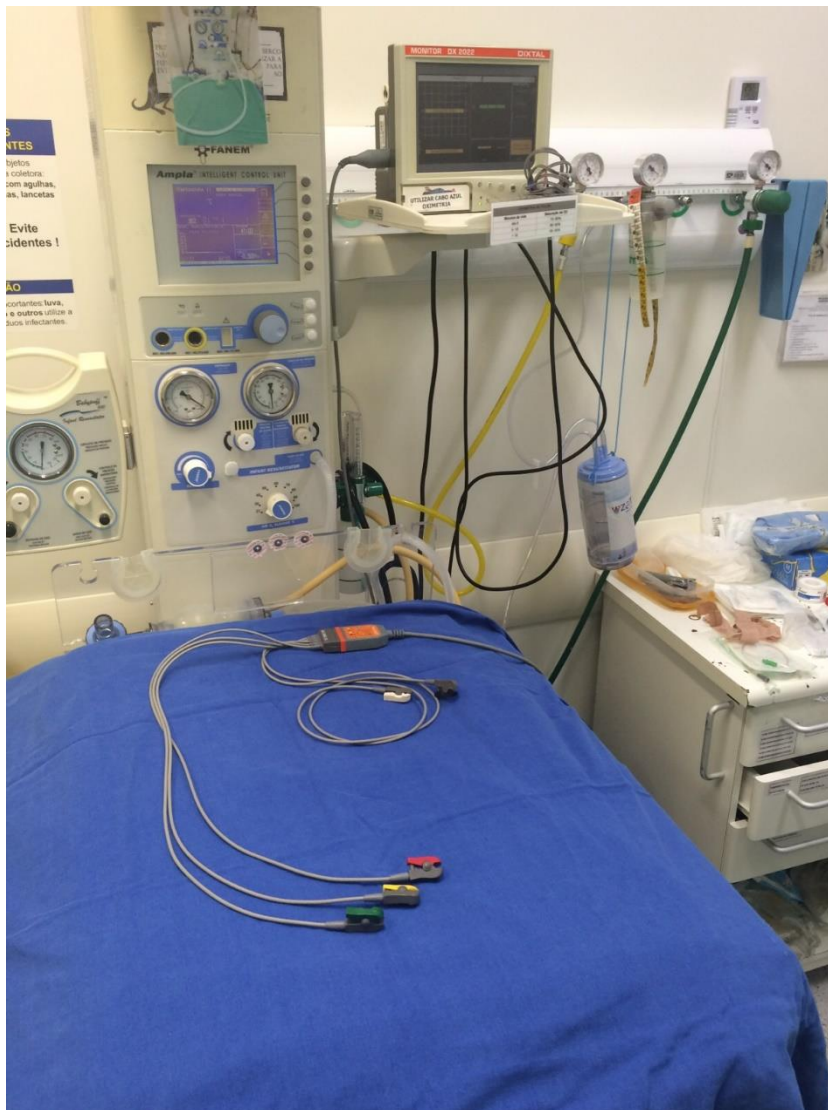


PREPARING FOR NEONATAL CARE: ANAMNESIS

- ✓ The team responsible for assisting the newborn should be notified as soon as possible of the admission of a mother with suspected or confirmed COVID-19
- ✓ A detailed anamnesis should be done to identify risk factors associated with the need for neonatal stabilization or resuscitation procedures

Antepartum Risk Factors	
Gestational age less than 36 0/7 weeks	Oligohydramnios
Gestational age greater than or equal to 41 0/7 weeks	Fetal hydrops
Preeclampsia or eclampsia	Fetal macrosomia
Maternal hypertension	Intrauterine growth restriction
Multiple gestation	Significant fetal malformations or anomalies
Fetal anemia	No prenatal care
Polyhydramnios	
Intrapartum Risk Factors	
Emergency cesarean delivery	Intrapartum bleeding
Forceps or vacuum-assisted delivery	Chorioamnionitis
Breech or other abnormal presentation	Narcotics administered to mother within 4 hours of delivery
Category II or III fetal heart rate pattern*	Shoulder dystocia
Maternal general anesthesia	Meconium-stained amniotic fluid
Maternal magnesium therapy	Prolapsed umbilical cord
Placental abruption	





Source: HSP-EPM-Unifesp

PREPARING FOR NEONATAL CARE: PLACE OF BIRTH

- ✓ International standards recommend delivery in rooms with negative pressure, but their availability is reduced in Brazil
- ✓ Whenever possible, use predefined rooms for the delivery of the pregnant woman with suspected or confirmed COVID-19 and for the care of the newborn, with entry/exit flows for personnel, equipment and cleaning previously established
- ✓ Whenever possible, provide neonatal care in a room different from the delivery room. When not available, keep a minimum distance of **2 meters** between the mother and the neonatal resuscitation bed

VERIFICAR O MATERIAL ANTES DE CADA NASCIMENTO

- Mesa com acesso por 3 lados com fonte de calor radiante
- Fonte de oxigênio umidificado com fluxômetro e mangueira de látex (para o balão)
- Fonte de oxigênio com fluxômetro e espigão verde (para ventilador manual em T)
- Fonte de ar comprimido com mangueira amarela
- Aspirador a vácuo com manômetro e mangueira de látex
- Relógio de parede com ponteiro de segundos

MANUTENÇÃO DA TEMPERATURA

Temperatura da sala de parto _____ °C e da sala de reanimação _____ °C

- 1 campo cirúrgico e 1 pacote de compressas de algodão estéreis
- 1 saco de polietileno de 30 x 50 cm (reservar triângulo p/ touca plástica após corte)
- 1 touca de lã ou algodão
- 1 colchão térmico químico
- 1 termômetro digital clínico

AVALIAÇÃO DO RN

- 1 estetoscópio neonatal
- 1 oxímetro de pulso com sensor neonatal e bandagem elástica
- 1 monitor cardíaco de 3 vias com eletrodos e bandagem elástica

ASPIRAÇÃO

- 1 dispositivo transparente para aspiração de mecônio
- 1 sonda traqueal sem válvula de cada tamanho (Nº 6, 8 e 10)
- 2 seringas de 10 mL

VENTILAÇÃO E OXIGENAÇÃO

- Balão autoinflável com válvula de segurança a 40 mmHg e reservatório de O₂
- Ventilador manual em T com circuito completo (mangueira e tubo corrugado c/ peça T)
- Blender para mistura oxigênio/ar
- 1 máscara redonda com coxim de cada tamanho (Nº 00, 0 e 1)
- 1 máscara laríngea Nº 1

INTUBAÇÃO TRAQUEAL

- 1 laringoscópio infantil com lâminas retas de cada tamanho (Nº 00, 0 e 1)
- 1 fio-guia para intubação
- Cânulas traqueais sem cuff – 2 de cada tamanho (Nº 2,5/3,0/3,5/4,0mm)
- 3 fitas adesivas para fixação da cânula
- 2 pilhas AA e 1 lâmpada sobressalente

MEDICAÇÕES

- Adrenalina 1:10.000 em SF - seringas identificadas 1mL (EV), 5 mL (ET) e 10mL
- 2 ampolas de adrenalina 1:1000 / 5 flaconetes SF 10 mL / 1 frasco SF 250 mL
- 2 seringas de 1mL, 5 mL, 10mL e 20 mL; 5 agulhas 40x12 (rosa)
- 2 torneiras de 3 vias
- Bandeja com material estéril para cateterismo umbilical e cateteres Nº 3,5E, 5F e 8F

OUTROS MATERIAIS

- Bisturi, clampeador de cordão umbilical, álcool etílico e gaze

INCUBADORA DE TRANSPORTE

Temp. _____ °C

- incubadora ligada na rede elétrica
- luz acesa da bateria incubadora
- ventilador em T com blender
- oxímetro de pulso ligado na rede elétrica
- luz acesa da bateria do oxímetro
- torpedo O₂ >100 kgf/cm² e fluxômetro
- torpedo de ar comprimido >100 kgf/cm²



PREPARING FOR NEONATAL CARE: EQUIPMENT

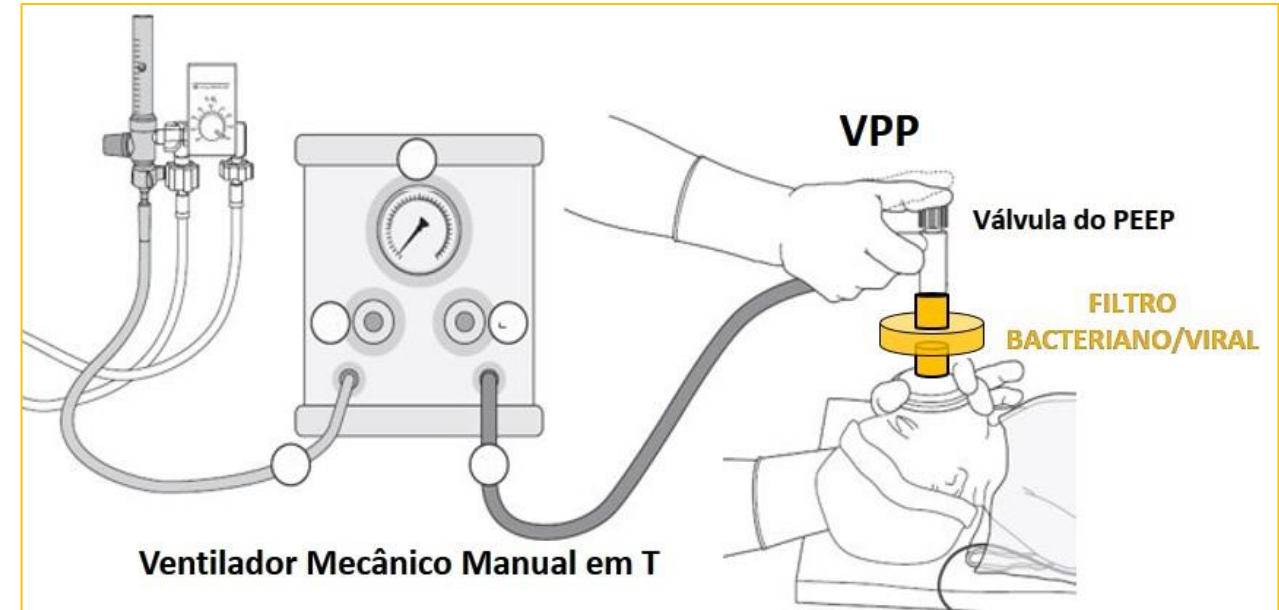
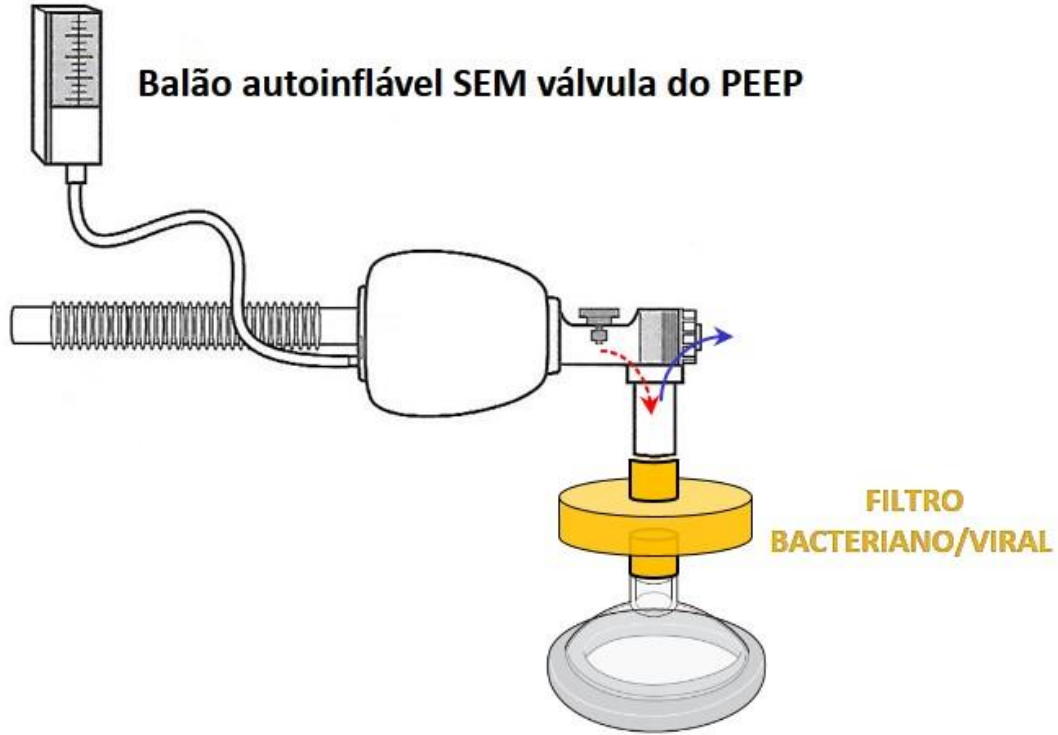
- ✓ All equipment necessary for the stabilization or resuscitation of the newborn must be prepared and tested before birth, and must be available in an easily accessible place
- ✓ Avoid seeking or introducing material between different rooms during the neonatal care. If extra material is needed, the team in the room should not leave. The necessary material must be delivered to the team by a professional who is outside the room
- ✓ The material for the care of the newborn whose mother is suspected or confirmed by COVID-19 is the one usually recommended by the national councils of resuscitation

PREPARING FOR NEONATAL CARE: EQUIPMENT

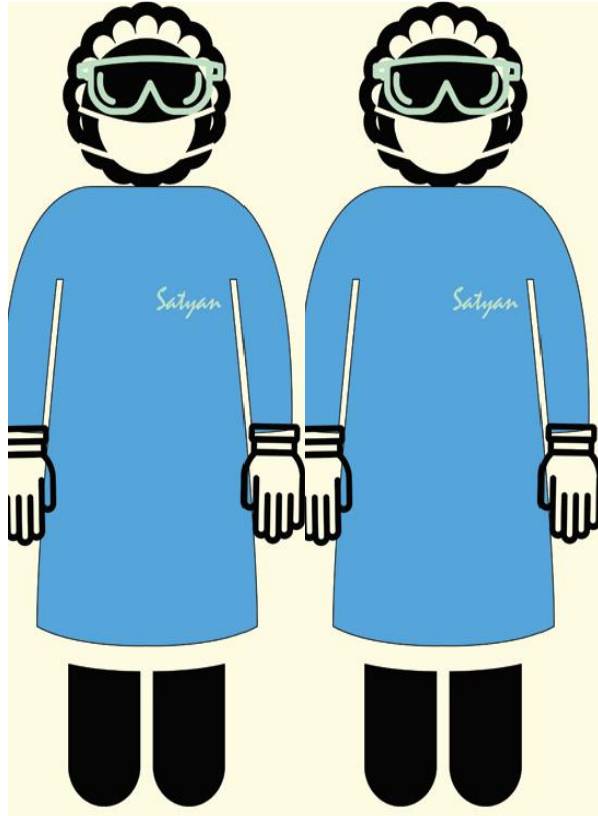
BACTERIAL / VIRAL FILTERS

- ✓ The use of filters for viral particles in devices to ventilate the newborn is being studied
- ✓ On the one hand, the filters could prevent the dispersion of viruses eventually excreted from the newborn's respiratory tract. On the other hand, vertical transmission of the disease does not seem to be important and, therefore, the chance that the newborn soon after birth will harbor viruses in the airways is small. In addition, the protection provided by viral filters is minimized when ventilation does not occur in a closed system, such as when there is a gas leak in ventilation with a face mask or tracheal tube
- ✓ If the option is to apply the filter to the self-inflating bag and/or the T-tube, install the viral/bacterial filter. Do not confuse with filters that only exchange heat and humidity (isolated HME filters). Use small/pediatric viral/bacterial filters to minimize the interposition of dead space in the ventilation circuit (always check manufacturer's specifications)

BACTERIAL / VIRAL FILTERS IN DEVICES FOR PPV IN THE DELIVERY ROOM



PREPARING FOR NEONATAL CARE: TEAM



- ✓ An adequate but minimal team must be prepared to assist the newborn in the delivery room
- ✓ The presence of 2 health professionals is recommended exclusively to assist the newborn, one of them must be fully qualified to perform advanced resuscitation procedures
- ✓ Airway procedures in a newborn of a mother with suspected or confirmed COVID-19 must be performed by the most experienced professional
- ✓ The excess of health professionals in neonatal care increases the use of PPE at a time when resources should be rationalized, and increases the chance of exposure of health professionals to infection



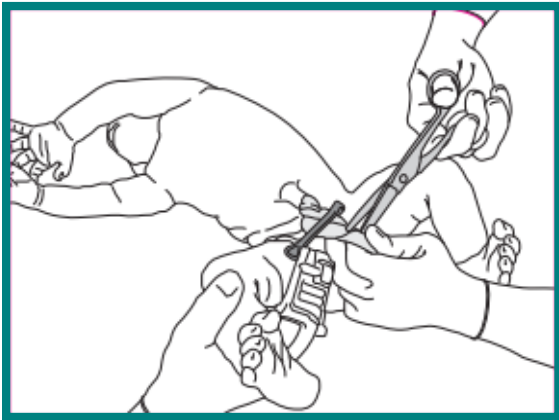
Fonte: <https://www.bbc.com/news/health>



Fonte: <https://theppedrive.com>

PREPARING FOR NEONATAL CARE: TEAM

- ✓ The team must frequently perform hand hygiene with water and liquid soap or alcoholic preparation (70%) and must be fitted with Personal Protective Equipment (PPE) for contact precautions, droplets and aerosols:
 - **Disposable, fluid resistant long-sleeved gown**
 - **Procedure gloves**
 - **Goggles and face shield**
 - **Head cap**
 - **N95 or PFF-2 mask**
- ✓ The team must dress in a room near to the delivery room, wait and enter the delivery room moments before birth



STARTING NEONATAL CARE

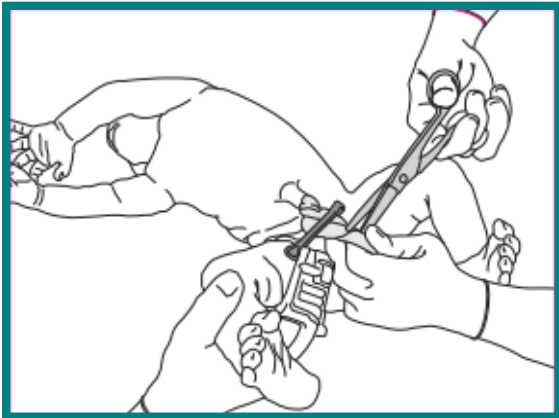
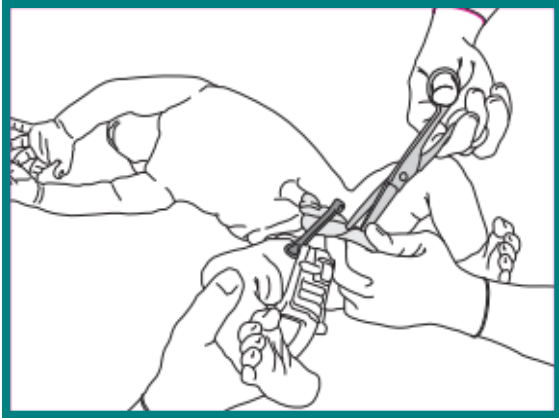
CORD CLAMPING



✓ The timing of umbilical cord clamping in neonates of mothers with suspected or confirmed COVID-19 is controversial.

✓ The recommendation of the **Brazilian NRP is DCC whenever possible:**

- For neonates with GA ≥ 34 weeks, adequate breathing and muscle tone at birth, clamp the umbilical cord 1-3 minutes after birth. The newborn should not be placed skin-to-skin with mother during this period
- For neonates with GA < 34 weeks who started to breathe or cry and are active at birth, wait 30-60 seconds before clamping the cord
- For all gestational ages, if the placental circulation is not intact or if the newborn does not start breathing or does not show good muscle tone, immediate cord clamping is recommended



CARE OF THE INFANT WITH GOOD VITALITY AT BIRTH



Brancusi – The newborn

- ✓ If, at birth, the newborn ≥ 34 weeks has good vitality:
 - Do not make skin-to-skin contact between newborn and mother immediately after delivery
 - After cord clamping, the newborn is taken to the resuscitation bed in heated cloths to perform routine service procedures
 - Skin-to-skin contact and breastfeeding should be postponed until a time when maternal hygiene care and measures to prevent newborn contamination can be adopted

CARE OF THE INFANT WITH GOOD VITALITY AT BIRTH



Brancusi – The newborn

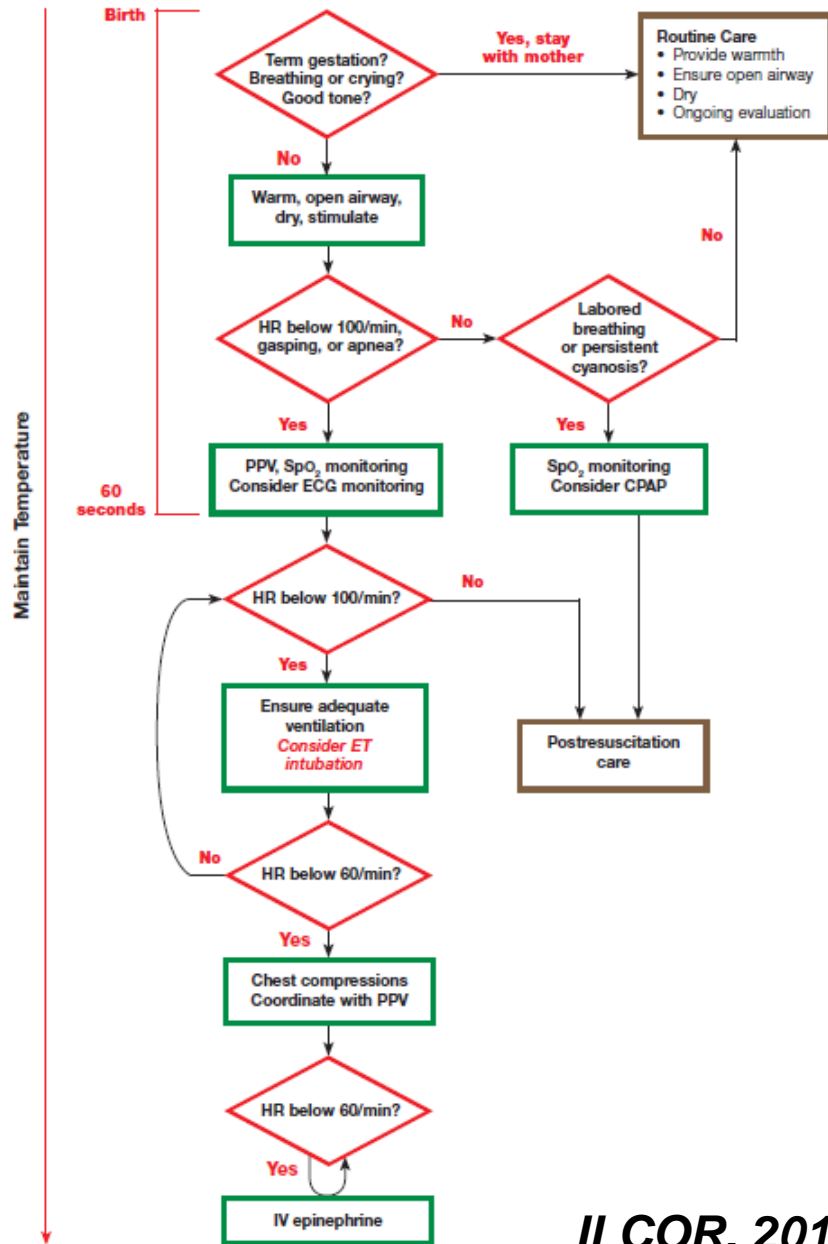
- ✓ If, at birth, the newborn <34 weeks has good vitality:
 - Do not make skin-to-skin contact between newborn and mother immediately after delivery
 - After cord clamping, the preterm infant is taken to the resuscitation bed in heated cloths, positioned under a radiant heat source, wrapped in a transparent plastic bag and a double cap is placed in

CARE OF THE INFANT WITH GOOD VITALITY AT BIRTH – BATHING

- ✓ Bathing of the healthy neonates of a COVID-19 suspected or confirmed mother soon after birth is controversial, since evidence of its protective role is scarce
- ✓ Some international organizations have suggested early bathing, when possible, for those born vaginally. This suggestion is based on the finding of important and sometimes prolonged viral excretion in feces, shown in adults infected with SARS-CoV-2
- ✓ However, it is not clear whether viruses excreted in maternal feces are viable and retain their infectious potential. The vernix, removed with the bath, can play a protective role for the neonatal epidermis. In addition, the immediate bath requires infrastructure and adequate personnel to be done
- ✓ **Due to the controversy, in Brazil it is suggested that the indication of bathing in the first hour of life should be individualized according to parental wishes, institutional routines and conditions of each service**

THE NEWBORN THAT NEEDS HELP TO TRANSITION OR RESUSCITATION PROCEDURES

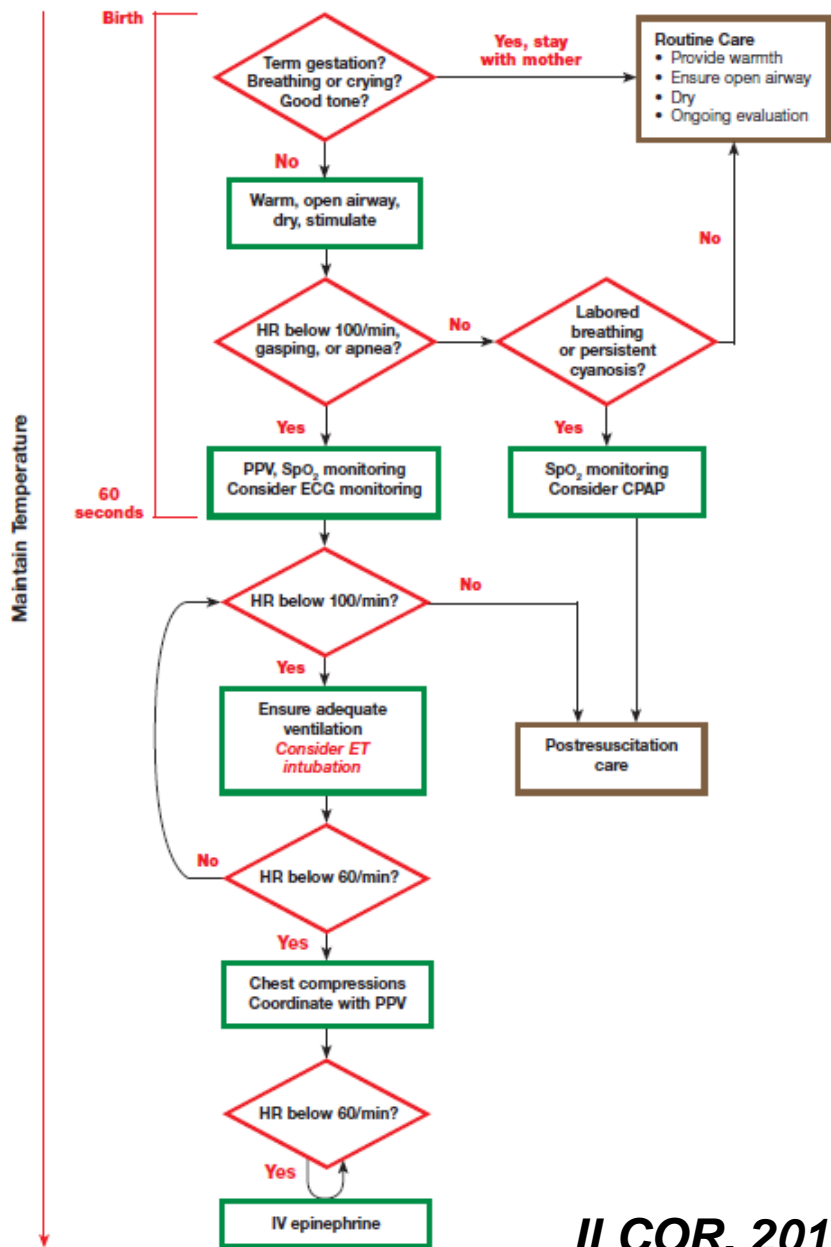
- ✓ The initial steps of resuscitation, PPV, tracheal intubation, chest compressions, medications, and the use of CPAP in the delivery room should follow national neonatal resuscitation programs guidelines
- ✓ There are no changes to the neonatal resuscitation guidelines for newborns of suspected/infected mothers with SARS-CoV-2
- ✓ It is advisable to reduce potential aerosol generating procedures, such as airway suction



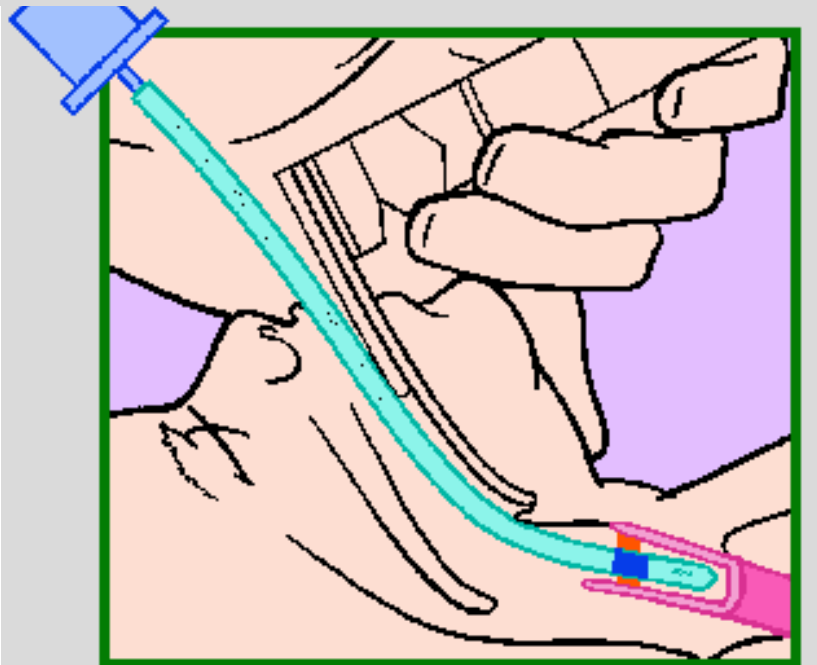
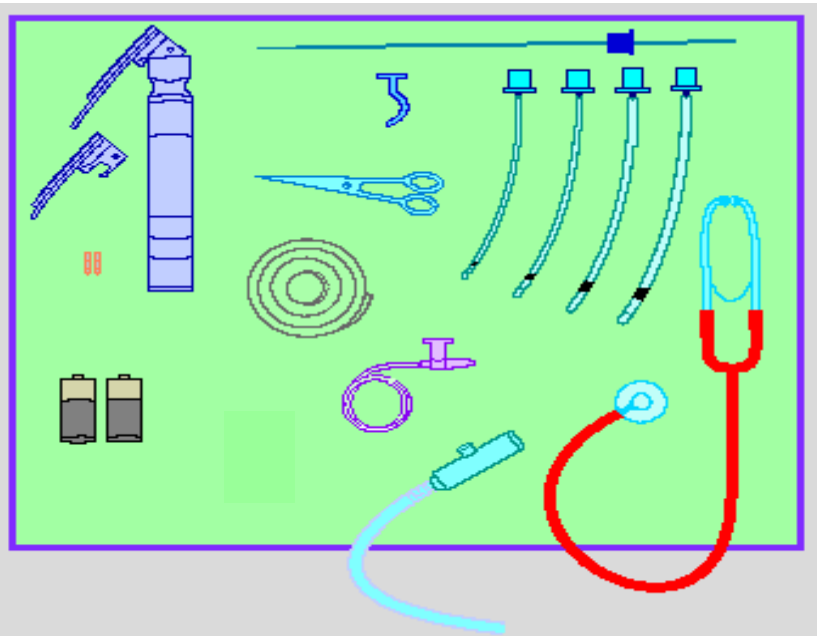
THE NEWBORN THAT NEEDS POSITIVE PRESSURE VENTILATION

- ✓ There is no indication for immediate tracheal intubation in neonates who require PPV
- ✓ Although evidence of infection of the respiratory tract at birth and subsequent viral spread from aerosols generated through devices or procedures has not yet been described:

- A viral/bacterial filter might be considered between T-tube or self-inflating bag and mask
- Two-person airway support reduces mask leakage and is preferred where sufficient staff with appropriate PPE are available
- Ensure that the most experienced team member carries out airway procedures



THE NEWBORN THAT NEEDS TRACHEAL INTUBATION



- ✓ In neonates with persistent bradycardia despite a properly performed PPV by mask, intubation should be performed with a tracheal tube of uniform diameter, without cuff, with appropriate size for GA or BW
- ✓ There is no evidence of decreased aerosol dispersion with the use of cuffed tubes. These tubes increase the risk of future complications, such as subglottic stenosis. Cuffed cannulas indicated in some international publications have cuffs specially designed for newborns and are not available in Brazil
- ✓ There is no evidence to use tracheal tubes obstructed by any device, as an attempt to reduce the transmission of virus by aerosol. Such a practice is possibly associated with the risk of delay in delivering effective ventilation to the newborn

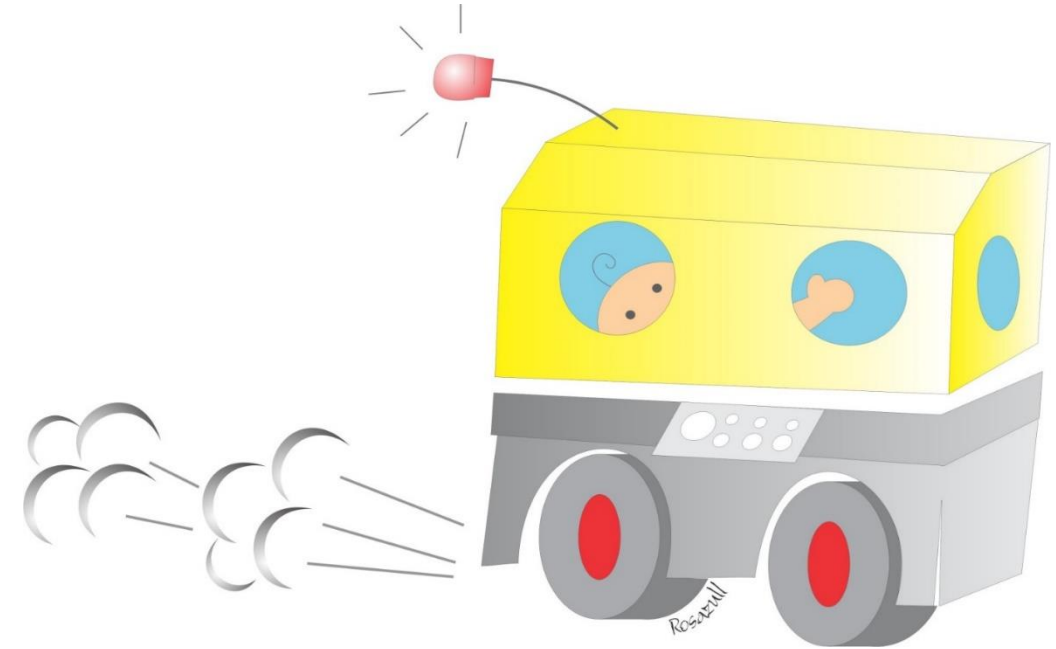
THE NEWBORN THAT NEEDS TRACHEAL INTUBATION

- ✓ Several international groups suggest intubation with the neonatal videolaryngoscope in order to increase the distance between the face of the health professional and the airways of the infant, if the mother has COVID-19 suspected or confirmed
- ✓ The viral load in the neonatal airways shortly after birth appears to be small, since the vertical transmission of SARS-CoV-2 does not seem to be important. Thus, tracheal intubation with the traditional laryngoscope by a professional protected with the PPE indicated for contact precautions, droplets and aerosols does not appear to increase the risk of professional exposure to infection
- ✓ **The videolaryngoscope is an expensive equipment, not available in most Brazilian services, with a relative indication in the care at birth of the newborn of a mother with suspected or confirmed COVID-19**
- ✓ If the option is for videolaryngoscopy, prior training of health professionals is essential so that the procedure can be successful and does not put the newborn who needs resuscitation at risk



TRANSPORT FROM DELIVERY ROOM TO NEONATAL UNIT

- ✓ The transport of the newborn of a mother with suspected or confirmed COVID-19 to any location in the hospital must be carried out in a transport incubator
- ✓ Proper cleaning of the incubator after each use is essential, according to the local guidelines
- ✓ It is important to pay attention to proper disposal and cleaning, of all non-disposable material and the environment used for neonatal care at birth, according to institutional protocols



It is necessary to consider that the disease is recent, the guidelines are based on studies of poor methodological quality and on expert opinions, naturally subjected to bias.

Thus, it is likely that, with the development of the pandemic and the acquisition of new knowledge, there will be changes in the concepts and guidelines presented here.

If, in medicine, in general, the truths are fleeting, the guidelines placed here for neonatal care in the context of the Covid-19 pandemic must be seen as "under construction".

