Western Cape Government

OFFICE OF THE DDG: CHIEF OF OPERATIONS
REFERENCE: COVID-19
ENQUIRIES: M Mukosi

TO: ALL PROVINCIAL TOP MANAGEMENT
SMS MEMBERS
HEADS OF FACILITIES

Dear colleagues

CIRCULAR 107 OF 2020: MATERNAL AND CHILD HEALTH RESPONSE PLAN FOR COVID-19

The purpose of this plan is to provide guidelines to manage the COVID-19 pandemic in the Maternal, Neonatal and Child population. The plan is comprised of two documents, namely:

1. Maternal and Child Health Response plan
2. Appendices containing protocols, guidelines and SOPs

Yours sincerely

Dr S Kariem
DDG: Chief of Operations
Date: 5/6/2020

WESTERN CAPE DEPARTMENT OF HEALTH

MATERNAL AND CHILD HEALTH SERVICES

RESPONSE PLAN TO THE COVID-19 PANDEMIC

PART 1

JUNE 2020

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PREAMBLE

The Premier and the Provincial political leadership have taken ownership and accountability to drive the Western Cape provincial strategy on COVID-19. The strategy requires collaboration of various stakeholders using a Whole of Government Approach (WoGA) and Whole of Society Approach (WoSA). Health has been mandated to provide the technical leadership to Western Cape Government to inform their strategic response.

Given our current understanding of COVID-19 in which the vast majority of infected individuals are adults, the Department of Health's response to the epidemic is understandably focused on preventing primary infection and strengthening adult and critical care services. There is concern that while child infections have less serious consequences for children, the health of children is nevertheless at huge risk of being adversely affected by the pandemic in multiple ways, including economic hardships; inadequate routine care; failure of immunization programmes; failure of feeding and social support programmes; bereavement; and failure of child protection services.

In this context it is important to make sure that the needs of pregnant mothers and children are not forgotten, and that adequate provision is made to care for COVID-19 exposed, infected and affected mothers, newborn babies and children, while maintaining optimal routine care of this vulnerable group of the population.

A key principle in all this is that maternal and child health services should not be compromised. It is acknowledged that the maternal and neonatal service platform has always been under immense pressure and it is anticipated that this will continue unabated even during the peak of COVID-19. Pressure on routine child health services will also be likely, especially during the SURGE season.

It is also essential to ensure that staff caring for both mothers and children are adequately protected. This may be complex given the number of pregnant women and children who may be asymptomatic at the time of admission, despite being infected with the SARS-CoV-2 virus.

A. EPIDEMIOLOGY AND MONITORING

1. GLOBAL OVERVIEW

There is limited information available on the impact of SARS-CoV-2 viral infection on pregnant women, newborns and children.

Pregnant women

Clinical manifestations of COVID-19 in pregnancy appear to be similar to those in non-pregnant individuals, where, co-morbid medical conditions including diabetes, severe obesity, and severe asthma, may increase the risk of complications including acute respiratory distress syndrome, arrhythmias, acute cardiac injury and shock.

Severe maternal illness, including pneumonia, has been associated with increased frequency of preterm labour, premature rupture of membranes, preterm birth, pre-eclampsia and delivery by caesarean section.

Newborns are at risk of acquiring infection via respiratory droplets and close contact with the mother during feeding but SARS-CoV-2 has not been detected in breast milk.

Children

Although children are likely to be at similar risk to adults for acquiring or transmitting SARS-CoV-2 infection, experience from other countries has shown that children experience significantly less severe disease and there have been very few deaths reported in children.

2. WESTERN CAPE

The Western Cape has become the epicenter of South Africa's COVID-19 epidemic, and has undertaken a massive increase in community screening, with accelerated testing resulting in many cases.

By the end of May 2020, a total of over 21 000 cases (with about 1200 in the under 19 age group) and just over 500 deaths were recorded in the province. The majority of confirmed cases (all ages) in the province had been in the Cape Town Metro.

The breakdown of cases by age group was as follows: <5 years: 22%, 5-9 years: 18%, 10-14 years: 23%, 15-19 years: 37%.

Scenario planning for the Western Cape is currently under development.

3. DEMOGRAPHY

Western Cape District breakdown by age group: Population statistics for year 2020							
Age	**Cape Town**	**Cape Winelands**	**Central Karoo**	**Eden**	**Overberg**	**West Coast**	**Western Cape**
0-2 years	211 516	48 109	3 756	31 139	15 812	24 008	334 340
3-5 years	218 998	48 238	4 362	32 039	15 811	25 299	344 747
6-13 years	594 405	127 281	12 055	86 581	40 622	64 614	925 558
14-20 years	456 250	101 906	9 554	68 642	29 953	50 631	716 936
Total	**1 481 169**	**325 534**	**29 727**	**218 401**	**102 198**	**164 552**	**2 321 581**

Source: Extrapolated from Stats SA 2020

4. HEALTH INDICATORS

The indicators that could be used to monitor and track the pandemic and its impact include those related to COVID-19; to the Surge Season; and to maternal, neonatal and child health services.

These are outlined in the Tables attached in the Appendix and include the data sources for these indicators and the population covered e.g. children admitted to hospital or those attending primary health care (PHC) facilities including clinics and community centres.

5. SOCIO-ECONOMIC INDICATORS

In the Western Cape in 2019, for 1 971 000 children aged 0 – 19 years, 23,4% lived in income poverty; 10% lived in households which reported child hunger; 397 000 (20.1%) lived in overcrowded homes; and 1 020 909 (51.8%) received the Child Support Grant. [1]

These are just some core indicators which are of relevance to strategies for mitigating the impact of COVID in children, by taking account of their current social and economic conditions.

[1] *SA Child Gauge 2019*

B. MATERNAL AND CHILD HEALTH (MCH) SERVICE PLANS

1. INTEGRATED PLANNING FRAMEWORKS

The frameworks are a graphic representation of integration of MCH services across the pathway of care – from community-based services (CBS) to the hospital.

The frameworks are annotated with reference to specific guidelines as attached in the appendices.

1.1 INTEGRATED MATERNAL SERVICES FRAMEWORK

<table>
<tr><th colspan="6">WESTERN CAPE DEPARTMENT OF HEALTH
INTEGRATED SERVICE PLAN FOR MATERNITY CARE</th></tr>
<tr><td></td><td>HCBC including Household & community</td><td>PHC facilities
(Clinic/CHC)</td><td>District hospital (Rural+ Metro)</td><td>Regional hospital/ Large Metro District Hospital</td><td>Tertiary hospital</td></tr>
<tr><td rowspan="2">HEALTH MESSAGING & INFORMATION FOR CAREGIVERS</td><td colspan="5">• HYGIENE PRACTICES
• SAFE INFANT FEEDING , NUTRITION SUPPORT & COUNSELLING
• ROUTINE MESSAGES (INCL 1ST 1000 DAYS & PARENT SUPPORT)</td></tr>
<tr><td></td><td></td><td colspan="3">• DISCHARGE AND DE-ISOLATION GUIDELINES[1]
• VISITING POLICY[2]</td></tr>
<tr><td>SCREENING OF MOTHER for COVID</td><td>CHWs
Contact tracing team[3]</td><td>Screening in CHC. Admission to labour area only if cannot be transferred</td><td colspan="3">Maternity care algorithm for Covid-19 as attached</td></tr>
<tr><td>REPRODUCTIVE HEALTH SERVICES AND INFORMATION</td><td colspan="2">CHWs and PHC
Diagnosis of pregnancy, emergency contraception, assessment and referral for termination of pregnancy, comprehensive contraception services</td><td colspan="3">Early pregnancy complications and termination of pregnancy services
Family planning services</td></tr>
<tr><td>BOOKING AND ANTENATAL CARE</td><td>NO</td><td>BANC and referral as per protocols</td><td colspan="3">Levels of care as per maternity established protocols</td></tr>
<tr><td>TESTING OF MATERNITY PATIENTS</td><td>NO</td><td>Testing all who screen positive as per Covid case definition as</td><td colspan="3">Maternity care algorithm for Covid-19 as attached</td></tr>
</table>

			updated from time to time	
PPE			PROVINCIAL GUIDELINES FOR PPE[6] Second stage of labour and caesarean section designated as aerosol generating procedures (AGP). PPE defined in Provincial ID package of care as updated from time to time.	
REFERRAL		Postnatal care guideline	Referral pattern does not change during COVID-19	MATERNITY CARE PATHWAY MATERNITY DISCHARGE PLAN
			Case manager assigned to the COVID-19 +ve case at substructure or sub-district level to conduct a telephonic screen using the current PNC checklist and refer when indicated.	
CLINICAL MANAGEMENT	Assessment: disease severity		Intermediate Care SOP PHC GUIDELINES	MATERNAL HEALTH PLAN FOLLOW TERTIARY COVID PROTOCOLS AT TERTIARY CARE
		Emergency management including intubation and NIV guidance		
	ICU	Maternity ICU Guidelines. Depends on service delivery design at tertiary level. Refer to GSH and Tygerberg Hospital		

1.2 INTEGRATED SERVICE FRAMEWORK FOR NEWBORNS & CHILDREN > 28 DAYS

<table>
<tr><th colspan="7">WESTERN CAPE DEPARTMENT OF HEALTH
INTEGRATED SERVICE PLAN FOR NEWBORNS AND CHILDREN</th></tr>
<tr><td colspan="2"></td><td>Home- and Community-Based Care (HCBC)</td><td>PHC facilities
(Clinic/CHC)</td><td>District hospital (Rural+ Metro)</td><td>Regional hospital/ Large Metro District Hospital</td><td>Tertiary hospital</td></tr>
<tr><td colspan="2" rowspan="2">HEALTH MESSAGING & INFORMATION FOR CAREGIVERS</td><td colspan="5">• HYGIENE PRACTICES
• SAFE INFANT FEEDING, NUTRITION SUPPORT & COUNSELLINGROUTINE MESSAGES (INCL 1ST 1000 DAYS & PARENT SUPPORT)</td></tr>
<tr><td></td><td></td><td colspan="3">• DISCHARGE AND DE-ISOLATION GUIDELINES[1]
• VISITING POLICY[2]</td></tr>
<tr><td colspan="2">SCREENING OF BABY / CHILD</td><td>CHWs
Contact tracing team[3]</td><td>PHC GUIDELINES[4]</td><td colspan="3">CHILD HEALTH PLAN[5]</td></tr>
<tr><td colspan="2">TESTING OF NEWBORNS and CHILDREN</td><td>NO</td><td>NO testing of newborns[5]
Testing of some children[5]</td><td colspan="3">CHILD HEALTH PLAN[5]</td></tr>
<tr><td colspan="2">PPE</td><td></td><td colspan="4">PROVINCIAL GUIDELINES FOR PPE[6]
WC CHILD HEALTH PLAN</td></tr>
<tr><td colspan="2">REFERRAL</td><td>HCBC guidelines[7]</td><td>Referral pattern does not change during COVID-19</td><td colspan="3">CHILD HEALTH PLAN
NEONATAL DISCHARGE PLAN[8]</td></tr>
<tr><td rowspan="3">CLINICAL MANAGEMENT</td><td>Assessment: disease severity</td><td></td><td>Intermediate Care SOP[9]
PHC GUIDELINES[4]</td><td colspan="3">CHILD HEALTH PLAN
FOLLOW TERTIARY COVID PROTOCOLS AT TERTIARY CARE</td></tr>
<tr><td></td><td colspan="5">Emergency management including intubation and NIV guidance</td></tr>
<tr><td>PICU</td><td colspan="5">Paediatric ICU Guidelines[10]</td></tr>
</table>

Guide to the Integrated framework

1. Services and Management of Children: Child Health Plan pg 14
2. Visiting policy: No visitors allowed except for mother/ caregiver rooming in.
   For labour ward, see Maternal Care document.
3. Contact tracing team guidelines for caregivers
4. PHC Guidelines and algorithm
5. Services and Management of Children: Child Health Plan: Appendix 1

6. Services and Management of Children: Child Health Plan: Appendix 2
7. Home- and Community-Based Care (HCBC) guidelines
8. Services and Management of Children: Child Health Plan
9. Intermediate Care SOP for St Josephs
10. PICU guidelines

2. SPECIFIC HEALTH SERVICE ISSUES

2.1 Community-Based Services

The *Outbreak Response Team* has developed a guide to be used in tracing of contacts. This includes addressing concerns related to keeping children safe; advice for when children become ill; and recommended activities for older children.

One group of *Community Health Workers* continues to provide routine community-based care, while another group is dedicated to undertaking screening in accordance with national screening guidelines, and with a focus on hot spots.

2.2 Primary Health Care Services

2.2.1 ***Routine Maternal, and Child Health services should continue at PHC level.***

- This includes acute care, PMTCT services, ante- and postnatal care, family planning services (preferably encourage long acting methods), pregnancy tests, growth monitoring and promotion, Vitamin A supplementation and deworming (children < 5 years old) and the Nutrition Therapeutic Programme.
- HIV and TB screening and testing will continue at clinics and CHCs.
- TB screening and testing will continue for contacts
- Routine care for children with HIV and TB will be provided, with de-escalation to daily DOTS at clinics for uncomplicated clients. Medication will be issued every 2 weeks for the first month and monthly thereafter. Adherence counselling will be done telephonically.
- Implementation of RTHB

2.2.2 ***Immunisation services should continue,*** with routine and opportunistic immunization of children where adequate physical distancing can be achieved. A

clear ***catch-up plan*** should be made for those who were unable to access routine immunization during the lock-down period.

2.2.3 ***Neonates and children seen for acute care and emergencies*** should be managed according to current guidelines and referred appropriately.

2.2.4 ***Children with long-term health conditions*** (e.g. epilepsy, asthma, eczema)

- Care for children with long term health conditions will continue at PHC level.
- Those who require referral to hospital services for outpatient care should be discussed with receiving outpatient department and booked accordingly. All patients to be accompanied by appropriate referral letter.
- Child on chronic medication should be provided with an adequate supply of medicine.
- Arrangements should be made for the collection or delivery of chronic medication according to the local protocols during the COVID-19 crisis.

Any special care that is required at PHC level should be noted in Road To Health Booklet by all healthcare workers.

2.2.5 ***Neonates or children who are positive for COViD-19***

- Neonates or children that screen positive for possible COVID-19 infections should be managed according to the referral pathway at PHC level for children.
- Neonates and children who tested positive and that were treated for COVID-19 would be able to access PHC services after self-isolation and treatment at home, hospital or at a step-down facility.

2.3 <u>De-escalation of services</u>

At every hospital, there are plans for de-escalation of routine health services, while ensuring on-going delivery of

emergency and essential hospital services, as well as management of time-sensitive conditions, during the national lockdown period and COVID-19 pandemic.

Specialist outpatient clinics as well as outreach and support services will be de-escalated with non-urgent outpatient appointments to be postponed and patients given alternative dates.

Management of communicable disease (eg. HIV and TB) should continue, with routine screening, testing and treatment provided at the facility level for those clients.

Stable chronic patients to be issued at least 2 months' supply of medicine to reduce visits.

The following services will continue:

a) **Acute emergency care at all healthcare facilities**
Elective walk-ins of healthy patients will be discouraged. New referrals must be triaged by a senior clinician and stratified as below. No "cold cases" accepted until further notice.

b) **Risk stratification** involves folder review and stratification of patients into a category below
   - **Defer:** Non-essential face-to-face consultations will be postponed, and substituted with medication collection visits.
   - **Telehealth:** An essential review that can be performed via telehealth. This decision may be made after confirmation by a doctor that such a visit is necessary, either by folder review or during the phone call to postpone the visit for patients who were previously deemed deferrable.
   - **Essential face-to-face visits:** These may continue after confirmation by a doctor that such a visit is necessary, either by folder review, during the phone call to postpone the visit or subsequent to a telehealth visit.

c) If unable to contact patients, Home and Community-Based Care services, including community health workers, may be utilized to trace patients.

2.4 Metro and Rural Health Services

It is important to take into account the difference in primary care service delivery between the Metro and Rural services.

In the *Metro*, both the City of Cape Town as well as the Provincial Department of Health render Maternal and Child Health services. It is thus essential that there is communication and alignment between the two services. Here MCH services are nurse led, with access to doctors.

In *rural areas*, doctors are mostly available at the district hospitals and only few specialists are available at regional hospitals. Due to this, as well as geographic constraints, local adaptations to the guidelines will need to be made.

2.5 Paediatric Critical Care

The international literature suggests that there is not a significant upsurge in the number of children who require high care and intensive care during the COVID-19 pandemic.

Yet the age profile of the population in South Africa may demand a different approach, related to possible delayed access to health services and the wider socio-economic implications of the pandemic, both of which may increase the need for high and intensive care.

There will be different phases of the pandemic, ranging from low to very high impact, and finally to longer term impact. During all phases of the pandemic, the usual demands for paediatric critical care related to the winter surge in acute respiratory infections; neonatal and congenital problems; surgical conditions; and complex problems in areas such as oncology, nephrology, and cardiology, will not reduce.

Recommended approach to high care and critical care services for children

While pressures on services are not high, it is necessary to continue to provide as much elective intensive care to children as possible (this means that surgical processes should continue as far as possible)

If pressures on services increase, then narrow the range of surgical services that are regarded as "elective". This may be challenging particularly as there are many conditions where delay in surgery will result in higher risk to patients (and staff) and increased use of scarce resources. Guidance in dealing with elective surgery during the COVID-19 pandemic is provided on Provincial Circular H62/2020.

If pressures increase further, it may become necessary to move to emergency care only in the high care and intensive care areas.

2.6 Emergency Medical Services

This is a vital part of the care continuum in the service platform.

Guidelines for the transportation of mothers, newborns and children infected or affected by COVID-19 have been developed.

2.7 Mental health

The COVID-19 pandemic places a strain on families with respect to psychological stress, domestic violence and food insecurity.

Guidance on dealing with anxiety and depression will be provided to mothers during the antenatal, perinatal and postnatal periods. Mental health support will also be provided to children and families in dealing with illness and death. Mental health messages are being identified as part of a broader communication strategy for implementation at the different levels of care.

As far as possible, there will be no separation of mothers and children; should the mother be unwell a suitable trusted caregiver should be identified to care for the child in the interim.

2.8 Palliative Care

Neonates and children requiring palliative care should be managed in line with the provincial palliative care policy.

2.9 Scholars and Adolescents

Guidelines for the care and protection of these two sub-groups in the population of children aged 0 – 19 years need specific attention in accordance with their routine management.

In particular, provision of advice to Department of Basic Education regarding health management of children returning to school is under way.

2.10 Nutrition

Food and nutrition insecurity is one of the challenges during the COVID 19 pandemic affecting families and their vulnerable children.

Nutrition support provided through the NTP and dietetic services can be accessed for at risk children. Policies and guidelines to prevent and address poverty related hunger and malnutrition are in existence, linkages between departments are established and can be further strengthened.

3 MOTHERS AND CHILDREN

The principle of non-separation of mothers and children as being in the child's best interest guides general practice with regard to maintenance of retaining the mother-child contact.

Recommended deviations to be applied include limiting access of mothers to newborn facilities where there is a high risk of staff exposure to possible asymptomatic maternal infections.

Close links between maternal, neonatal and paediatric care provide an opportunity for platform arrangement with possible cross cover support at the peak of COVID 19 pandemic. Specialists in obstetrics, neonatology and paediatrics (largely nursing and medical) should not be expected to cover adult services if there are pressures in maternal and child health platform.

Mixed ECs place great risk on children imposed by proximity to sick adults. Under these circumstances, it may be beneficial to shift paediatric services to the Red Cross War Memorial Children's Hospital where possible. This will also alleviate pressures on overstretched adult services.

C. ALGORITHMS and CLINICAL PLANS: ATTACHED IN APPENDICES

1. **ALGORITHMS**
   1.1 Maternal Care:

   1.2 Neonatal Care

   1.3 Primary Health Care: Children > 28 Days - <5 years

   1.4 Children of all ages

2. **CLINICAL PLANS**

   2.1 Maternal and Newborn Guidelines

   2.2 Newborn care

   2.3 Clinical management of children

D. INTERSECTORAL COLLABORATION

1. Impact

The community and social impact of the Covid-19 pandemic on families, mothers and children is affecting all the critical aspects of the essential care children need to survive and thrive in its storm and in its aftermath.

2. Areas for collaboration

Priority areas for inter-departmental intersectoral collaboration include the following:

2.1 Social Development

a. *Protection of Women and Children*

(i) Lockdown has resulted in a marked increase in reported gender based and domestic violence has occurred during the lockdown, and children are subjected to unsafe home and community environments.

(ii) *Intersectoral mechanisms to provide for specific needs of children (and their duly appointed caregivers) related to the effects of Covd19 on caregiving arrangements and movement into and out of the alternative care system (residential facilities, temporary safe care- and foster care settings) in particular the provision of psychosocial support.*

(iii) *Existing referral protocols to be used with reference to referral to DSD for any cases of malnutrition and wasting at all levels of care (via referral to Health Social Worker), child abuse and abandoned babies (via Uniform Referral Pathway) and DOH-DSD referral for psychosocial care and support in the context of Covid 19 (via new Provincial Protocol dated 1-6-2020)*

b. *Provision of Food and Nutrition*

In an environment where child malnutrition is rife, and household food security is under serious threat, provision of, and access to food; and ensuring adequate nutrition of children is paramount.

c. *Social Grants*

The recent announcement of changes to social grants is welcomed, and the challenge will be to ensure that the more than 1 million children who are already on the child support grant are able to access the extended provisions.

2.2 Basic Education

Closure of schools demands strategies to ensure sustained learning and feeding of scholars in need. Reopening of schools should happen only after ensuring that adequate safety measures are in place to limit the spread of corona virus.

2.3 Economic Development

Families under duress due to lack of income are due to receive relief through social grants and other poverty reduction and income protection measures.

2.4 Home Affairs

The Department of Home Affairs resumed registering births from 1 May, when the country entered level 4 lockdown.

This pertained to registration of the births of children born from 26 February and during the level 5 lockdown period, which will not be regarded at late registrations.

E. FACILITIES

Health care facilities should ready themselves to care for non-COVID, suspected COVID and confirmed COVID-19 positive cases.

In order to appropriately manage the diverse group of patients being treated at any facility, clinicians need to be supported by a quick turn around time of diagnostic tests.

Facilities need to consider isolating suspected cases and positive cases from other patients, as far as is possible, taking into account of their individual local contexts. This is to reduce the risk of

infection spread to other patients as well as to health care workers and other staff at the facilities.

Infected patients require isolation, whereas those who have been exposed to possible infection may require quarantine until such time as their infection status can be determined.

The table below depicts the number of operational beds available for Maternal, Neonatal and Child Health Services.

Districts	Current Operational Maternity Beds		Current Operational Children's Beds		Current Operational Neonatal Beds			All children + Neonates Beds excluding KMC
	General maternity April 2020	High Care and ICU April 2020	General paediatric beds April 2020	HC and ICU April 2020	General neonatal beds April 2020	High Care and ICU April 2020	KMC beds Neonates Report	Overall Paediatrics April 2020
Central Karoo	21	0	21	0	7	0	5	28
Cape Town	488	43	654	109	215	189	116	1167
Cape Winelands	136	0	126	4	22	12	24	164
Garden Route	101	0	108	0	35	7	17	150
Overberg	47	0	39	0	0	3	8	42
West Coast District Municipality	44	0	68	0	0	0	8	68
Total	837	43	1016	113	279	211	178	1619

Source: Hospital Management

1. Maternity and newborn facilities

Provision must be made in the maternity unit and nursery for the care and delivery of pregnant women with COVID-19 infection and their babies.

There are 4 scenarios that hospitals must prepare for:

- Delivery and resuscitation;
- Well baby of COVID-19 infected mother;
- Sick or small baby of COVID-19 infected mother.
- Asymptomatic mothers in labor

Because of the risk of asymptomatic and pre-symptomatic women presenting to maternity service, routine IPC and universal precautions must apply to all maternity admissions. Strict adherence to screening, testing, face masks for patients, isolation is suspected COVID-19 and handwashing must apply. In addition, special precautions including full PPE will apply to the second stage of labour and caesarean section. Details are in the Provincial PPE guideline as updated from time to time.

2. Paediatric and Neonatal Critical Care facilities (beds)

a. *Red Cross War Memorial Children's Hospital*

There are 22 funded PICU beds at the Red Cross War Memorial Children's hospital (there are spaces and equipment available for up to 29 patients, but these are currently not staffed). These beds are used for neonatal, paediatric, and paediatric surgical patients (including all the sub-speciality services and burns patients).

For most of the year the bed occupancy is in excess of 85%, and there are times when patients are refused elective surgery because of lack of bed space.

Red Cross War Memorial Children's Hospital has 39 high care beds comprised of 8 neonatal high care beds and 31 paediatric high care beds.

b. *Tygerberg Children's Hospital*

Tygerberg Hospital has 10 PICU beds that are equipped and staffed. These beds are used primarily for paediatric and paediatric surgical patients, with limited numbers of paediatric surgical subspecialist services.

There are 4 neonatal high care beds in the hospital. There are 4 step-down beds (don't take acute admissions) and 6 tracheostomy beds

c. *Regional hospitals*

There are "high care" areas at other hospitals such as Paarl, Worcester, George hospitals that are actually intensive care areas. None of those beds are specifically allocated by children, but in Worcester and George children can be ventilated in these areas.

There are patients at Paarl, Worcester and George hospitals that receive nCPAP and high flow in the paediatric wards, but without allocation of high care beds.

There are 1-2 patients at a time who may receive high flow humidified nasal oxygen at Somerset Hospital. This is not a designated high care area.

d. *Private hospitals*

There are paediatric ICU beds at the Chris Barnard Hospital, which are used primarily for paediatric cardiothoracic patients, and for patients in the private sector who required mechanical ventilation.

The definition of high care beds is not applied uniformly in all health care facilities. High care is provided in multiple units throughout all the paediatric services. It is clear that there are considerably more patients receiving high care (as defined by a combination of nursing and medical work, as well as severity of illness) at any one time than there are "high care beds" in the various facilities. There are children on mechanical ventilatory support; renal replacement therapy; close observation following major trauma or major surgery. All of them in units that are not currently defined as "high care"

3. District hospitals

Each of the large district hospitals *in the Metro* has a paediatrician on site with dedicated paediatric beds, but no high care or ICU facilities. PUI for COVID-19 should be cohorted in a dedicated paediatric area. Neonates or children requiring high care or ICU should be referred to the appropriate institution where appropriate facilities are available, and according to standard referral pathways.

District hospitals *outside the Metro* have dedicated paediatric beds, but no paediatrician on site and no high care facilities. They may not have the capacity to cohort or isolate pediatric patients in a dedicated paediatric area. Neonates or children requiring high care should thus be referred to the appropriate secondary hospital and patients requiring ICU to the appropriate tertiary hospital according to standard referral pathways.

4. Quarantine and Isolation Facilities

The provincial guidelines for quarantine and isolation should address the specific concerns related to children in quarantine or isolation with caregivers, or on their own, in respect of admission; management; monitoring; and care.

F. HUMAN RESOURCES

Ensuring adequate provision and support for human resources available for the care of mothers and children is critical in the environment of the COVID pandemic, where the impact on the health workforce itself may place such care in jeopardy.

Implementing an effective contingency plan for the MCH workforce requirement is thus central to the principle that maternal and child health services should not be compromised.

G. RECOVERY AND VIGILANCE

Recognising the secondary impact of COVID-19 on Maternal and Child Health and wellbeing for families and communities, the health and intersectoral actions proposed above must extend into the Recovery and Vigilance phase of the pandemic.

In this phase, re-integration and humanitarian support will be key aspects which should be monitored through an integrated intersectoral information system.

H. TASK TEAM MEMBERS

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PART 2

II. APPENDICES

A. HEALTH INDICATORS

The indicators that could be used to monitor and track the pandemic and its impact include those related to COVID-19; to the Surge Season; and to maternal, neonatal and child health services

COVID-19 INDICATORS (MATERNAL AND CHILD HEALTH)

COVID-19 INDICATORS	DATA SOURCES	COVERAGE
% Pregnant women with COVID-19	PPIP/ Sinjani	Inpatients
% Neonates with COVID-19	PPIP/ Sinjani	Inpatients
% children tested for COVID-19 (Rural and Metro)	Sinjani/Clinicom	Inpatients and PHC
% < 20 years tested positive for COVID-19	Sinjani/ Clinicom	Inpatients and PHC
% (including number) children who test positive by age (<28 days, 1mo.-5 yr., 5-9yr., 10-14yr, 15-19yr.)	Sinjani/ Clinicom	Inpatients and PHC
% < 20 yr. male/female positive for COVID-19	Sinjani/ Clinicom	Inpatients and PHC
COVID-19: % hospital admissions	Clinicom/ Sinjani	Inpatients
Mean (SD) number days admitted	Clinicom/ Sinjani	Inpatients
% admissions by sub-district/ district	Sinjani/ Clinicom	Inpatients
% < 20 yr. COVID-19 positive by district/sub-district	Sinjani/ Clinicom	Inpatients and PHC
% child deaths from COVID 19 (<5yr; 5-17yr.)	CDR/ Child PIP	Inpatients and PHC
% in-hospital and out-of-hospital deaths	CDR/ Child PIP	Inpatients and PHC
% In-hospital mortality rate COVID-19	Child PIP	Inpatients
% Case fatality rate COVID-19	CDR/Child PIP	Inpatients and PHC

SURGE INDICATORS (CHILD HEALTH)

Surge Indicators	Data sources	Coverage
Infant mortality rate	CDR/Child PIP/Stats SA	District/Prov.
Under 5 mortality rate	CDR/Child PIP/Stats SA	District/Prov.
% of child deaths in first year of life	CDR/Child PIP	Sub-district
% In-hospital mortality rate (IHMR) < 5 years	Child PIP/Sinjani	Inpatients
Diarrhoeal disease (% IHMR)	Child PIP/Sinjani	Inpatients

Diarrhoea incidence per 1000 under-fives	Sinjani	PHC
Diarrhoea: % hospital admissions	Child PIP/ Clinicom	Inpatients

Surge Indicators (cont.)	**Data sources**	**Coverage**
% under-fives with severe dehydration	Sinjani	Inpatients
Pneumonia incidence per 1000 under-fives	Sinjani	PHC
Pneumonia: % hospital admissions	Child PIP/ Clinicom	Inpatients
Pneumonia (% IHMR)	Child PIP/Sinjani	Inpatients
Severe acute malnutrition (SAM) (% CFR)	Child PIP/Sinjani	Inpatients
Immunisation coverage under 1 year	Sinjani	PHC
Pneumococcal vaccine 3rd dose coverage	Sinjani	PHC
Rotavirus 2nd dose coverage	Sinjani	PHC
Measles 1st dose under 1 year coverage	Sinjani	PHC
Measles 2nd dose coverage	Sinjani	PHC
Infant exclusively breastfed at 3rd dose Hepatitis B	Sinjani	PHC
Vitamin A supplementation coverage of children 1-5 yrs.	Sinjani	PHC

IHMR: In-hospital mortality rate; Child PIP: Child Healthcare Problem Identification Programme; PPIP: Perinatal Problem Identification Programme; CDR: Child Death Review; PHC: primary health care; Prov: provincial

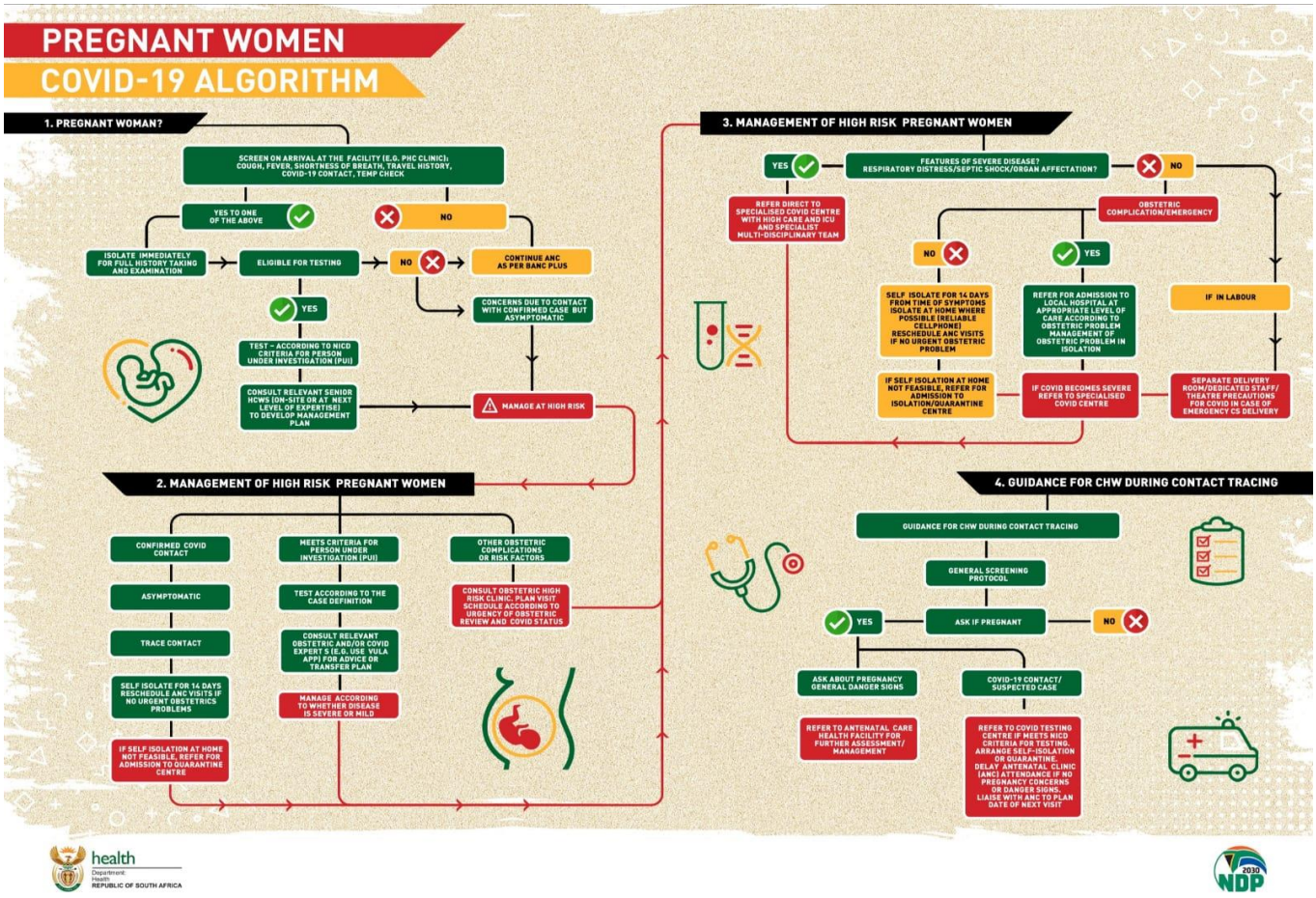
MATERNAL, NEWBORN AND CHILD HEALTH INDICATORS

INDICATOR	**DATA SOURCES**	**COVERAGE**
Antenatal visit before 20 weeks rate	Sinjani	PHC
Antenatal 1st visit coverage	Sinjani	PHC
Antenatal mother HIV test +ve rate	Sinjani	PHC
Antenatal mother on ARVs rate	Sinjani	PHC
Delivery in facility rate	Sinjani/ Clinicom/ PPIP	Inpatients and PHC
Caesarian section rate	Clinicom/PPIP	Inpatients
Maternal mortality in facility ratio	Sinjani/ Clinicom	Inpatients
Mother postnatal visit within 6 days rate	Sinjani	PHC
Live birth < 2500g in facility rate	PPIP/Sinjani	Inpatients/ PHC

Stillbirth in facility rate	PPIP/Sinjani	Inpatients/ PHC
Early neonatal mortality rate	Neonatal mortality rate	PPIP& Sinjani
Neonatal mortality rate	PPIP& Sinjani	Inpatients
INDICATOR (cont.)	**DATA SOURCES**	**COVERAGE**
Perinatal mortality rate	PPIP& Sinjani	Inpatients
% term infants put to breast within 1-hour birth	Sinjani/ Clinicom	Inpatients & PHC
% children with underweight < 2 years	Sinjani	PHC
MAM < 5 yr. rate new and admissions	Sinjani/ Clinicom	PHC and inpatients
% children < 5 years on NTP (supplementation)	Sinjani	PHC
PMTCT: PCR at birth; PCR at 10 weeks rate	Sinjani/ Clinicom	Inpatients and PHC
PMTCT: PCR positive birth; PCR positive at 10 weeks	Sinjani/ Clinicom	Inpatients and PHC
PMTCT: HIV transmission rate 6 wks.; 10 wks.	Sinjani	PHC
PMTCT: NVP; NVP & AZT uptake in infants	Sinjani	PHC
% children HIV +ve (19-59 mo.; 5-14 yr.)	Sinjani	PHC
% TB symptomatic 5 years and older	Sinjani	PHC
% TB confirmed 5 years and older	Sinjani	PHC
% TB symptomatic 5 years and younger	Sinjani	PHC
% TB confirmed 5 years and younger	Sinjani	PHC
% DS TB treatment < 5 years	Sinjani	PHC
% DS TB treatment > 5 years	Sinjani	PHC
% TB contact < 5 years IPT uptake	Sinjani	PHC
School learner screening coverage (grades 1,4,8 &10)	Sinjani	PHC
School learner referral (vision, hearing, speech) rate	Sinjani	PHC

B. ALGORITHMS

1.1 Maternal management algorithm



1.2 MATERNAL CARE AT PRIMARY LEVEL

SCREEN +

↓

ISOLATE, SWAB, MASK

↓

ASYMPTOMATIC/MILDLY SYMPTOMATIC

SICK*

↓ ↓ ↓

NO OBSTETRIC ISSUE

OBSTETRIC ISSUE

<20/40- CHC MO to ass

<20/40- CHC MO to assist with stabilising patient. Discuss with referral hospital as for non-pregnant patients**

>20/40- CHC MO to assist with stabilising patient. Discuss with GSH B-side for transfer

↓ ↓

Counsel re danger symptoms

Self-isolate at home

Delay next antenatal visit

Contact number for pt for results and contact tracing

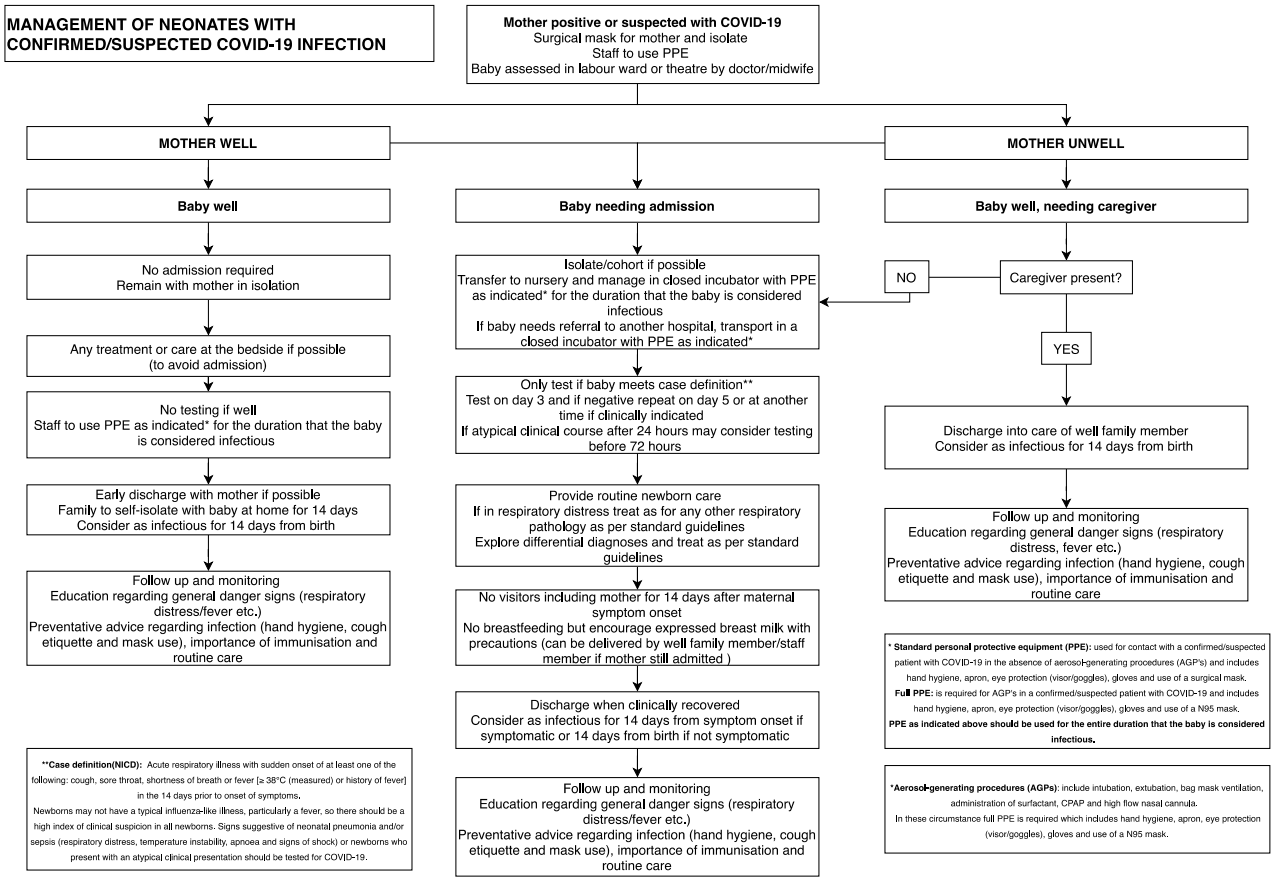
Discuss with referral hospital for transfer to PUI area or out-patient management of obstetric problem

*Respiratory distress: RR>25, O2 saturation <95%
Cyanosis
Confusion
↓level of consciousness
Temperature >39°C
Pulse >120

** If the patient is having any gynaecological complications, she should also be discussed with the gynae dept at the referring hospital

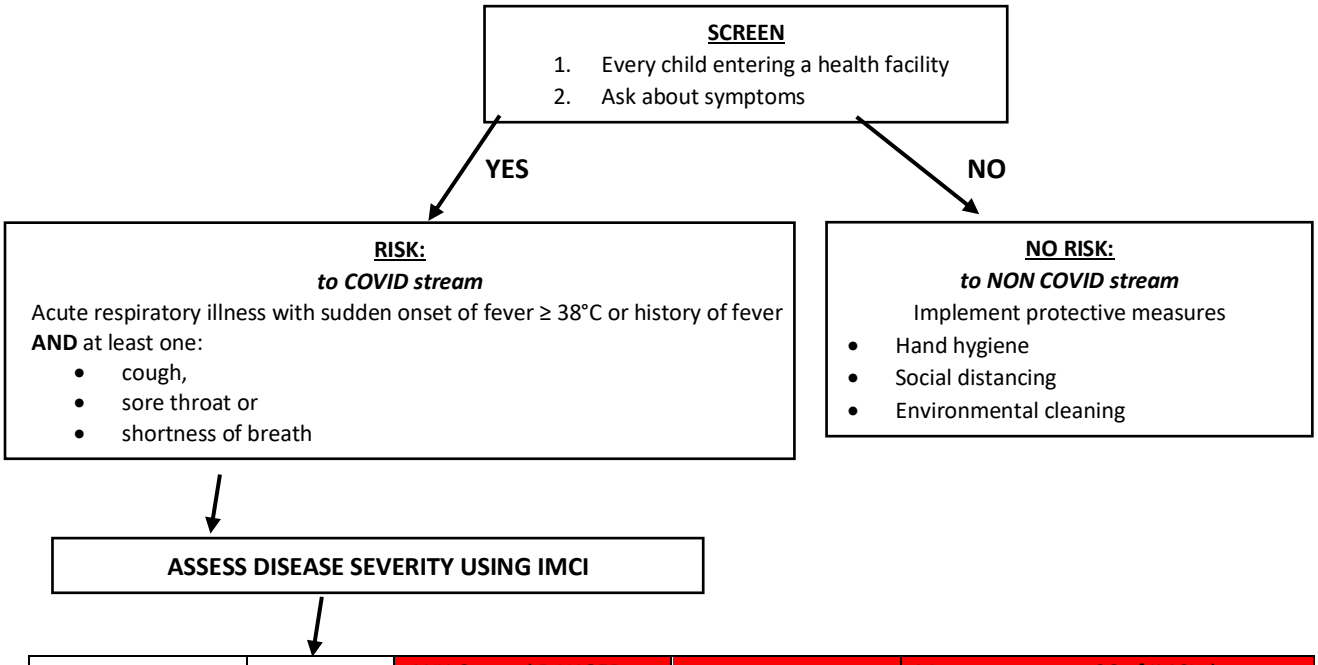
All maternity units must have a COVID isolation area and PPE for women who are too far in labour to be transferred. Patients in labour with Covid symptoms should deliver in hospital where possible

1.3 Newborn management algorithm



1.4 Management Algorithm For PHC: Children >28 Days - 5 Years

This algorithm guides the management of all children and it is adapted for use by primary care facilities that have a nurse-led IMCI based service.



Assess the following: - **Danger signs (see box below)** - **Respiratory rate** - **Stridor** - **Chest-indrawing** - **Wheeze** - **Pulse oximetry (if available)**	**Classify Cough or Difficulty breathing**	ANY General DANGER SIGN OR Chest indrawing OR Stridor in calm child OR Oxygen sats <92% in RA	**SEVERE PNEUMONIA OR VERY SEVERE DISEASE** ***POSSIBILITY OF COVID-19 High***	Manage as per pg 26 of IMCI chart book Give Oxygen, First dose of Ceftriaxone, check Glucose, Keep warm If wheezing give Salbutamol via MDI + spacer and repeat after 15 mins# If Stridor, give ADRENALINE NEBS **REFER TO HOSPITAL** **SARS-CoV-2 PCR to be done at Hospital**
		Fast Breathing	**PNEUMONIA** ***POSSIBILITY OF COVID-19***	Manage as per pg 26 of IMCI chartbook Treat with Amoxil Advise caregiver when to return immediately Follow up in 2 days ***Do mid-turbinate nasal swab for SARS-CoV-2 PCR** **Home isolation for 14 days**
		NO signs of pneumonia or severe disease	**COUGH OR COLD** ***POSSIBILITY OF COVID-19***	Manage as per pg 26 of IMCI chartbook. ***Do mid-turbinate nasal swab for SARS-CoV-2 PCR** **Home isolation for 14 days**
	Classify wheeze	Any history of wheeze, cough at night, Wheeze for 7 days, on treatment for Asthma	**RECURRENT WHEEZE** ***POSSIBILITY OF COVID-19***	Manage as per pg 26 of IMCI Use MDI + spacer instead of nebuliser# ***Do mid-turbinate nasal swab for SARS-CoV-2 PCR** **Home isolation for 14 days**
		Any other wheeze	**FIRST EPISODE WHEEZE** ***POSSIBILITY OF COVID-19***	Manage as per pg 26 of IMCI chartbook ***Do mid-turbinate nasal swab for SARS-CoV-2 PCR** **Home isolation for 14 days**

see table below re nebulisation
* see section below on how to perform a mid-turbinate nasal swab

GENERAL DANGER SIGNS:

- **Inability to drink or Breastfeed**
- **Vomiting everything**
- **Lethargic or unconscious**
- **History of convulsions during this illness or currently convulsing**

FAST BREATHING	**If the child is < 2months**	**= >60**
	If child 2mo – 12mo	**= >50**
	If child older than 12mo- 5yr	**= >40**
	If child older than 5 yr	**= >30**

AVOID the following in children with COVID-19 or suspected COVID-19

1. Routine examination of the mouth and throat:
   If sore throat, treat with oral Penicillin or Amoxicillin
   (see page 30 of the IMCI chart book)
   Follow up in 5 days if symptoms worse or not resolving- then refer to hospital.

2. Nebuliser:
   For ***wheeze***, give Salbutamol via MDI and spacer 4-8 puffs. Allow 4-5 breaths per puff. Use a facemask onto the spacer for those children younger than 4 years
   If still wheezing repeat every 15 mins in the first hour.
   If no improvement, discuss with Dr. and reclassify as severe disease
   If improvement continue 2- 4 hourly.
   *For **stridor,** continue with nebulised adrenaline*

3. NSAID's and oral steroids
   Give paracetamol 15mg/kg for fever and pain
   Oral steroids are still indicated in those with known Asthma

4. Nasal or oral suctioning, Bag mask ventilation and CPAP
   Use full PPE for resuscitation

Management of Children with Suspected / Confirmed COVID-19

Criteria for person under investigation PUI), i.e. a person to be tested for SARS-CoV-2 (adapted from NICD, 9 April 2020):
Acute respiratory infection with sudden onset or history of fever (>38ºC) **AND** at least one of the following:
- Cough
- Sore throat
- Shortness of breath

Children at highest risk (MUST be tested):
Acute respiratory illness **AND** who in the 14 days prior to onset of symptoms:
- Had close or household contact with a confirmed COVID-19 case **OR**
- Had close or household contact with a health care worker who works in a facility where COVID-19 patients are being treated **OR**
- Anyone in the household with a flu-like illness or pneumonia

Test and Assess
- Apply surgical masks to child (if >2 yrs) & caregiver and isolate
- Perform COVID-19 test
- Assess severity of disease
- Consider alternative diagnoses including HIV testing, TB screening, nutritional assessment, immunisation
- COVID-19 test result:
  - if positive, notify
  - If negative & at home, de-isolate & monitor for 14 days
  - If negative & admitted, keep isolated

Mild disease
- Treat at home
- Admit to hospital or isolation facility if self-isolation at home is not feasible

Home treatment
- Paracetamol
- Nutritional support
- Alert to danger signs
- Home isolation

De-isolation
- 14 days from onset of symptoms

Moderate disease
- Admit to hospital
- Cohort with respiratory / COVID-19 cases

Hospital treatment
- Oxygen
- Paracetamol
- 3 – 4 hourly review
- Nutritional support
- Empiric antibiotics

De-isolation
- 14 days after stable –no longer need oxygen
- Continue treatment at home

Severe disease
- Admit to hospital
- Discuss with nearest high-care unit (HCU) / paediatric intensive care unit (PICU)

HCU / PICU admission
- General respiratory supportive measures (e.g. oxygen, stop feeds, consider proning)
- Manage as for severe pneumonia according to local unit protocols

De-isolation
- 14 days after stable –no longer need oxygen
- Continue treatment at home

Assessment of severity

	Mild	Moderate	Severe
Mental status	Normal	Restless	Irritable/lethargic
Feeding	Finishes feed	Does not finish feed	Unable to feed
Talking	Full sentence	Interrupted sentence	Unable to talk
Respiratory rate (breaths/min.)	<40 if under 1yr <30 if 1 – 5 years <20 if over 5 years	40-60 if under 2 months 40-50 if 2 – 12 months 30-40 if 1 – 5 year 20-30 if over 5 years	>60 if under 2 months >50 if 2 – 12 months >40 if 1 – 5 year >30 if over 5 years
Respiratory signs	No distress	Lower chest wall indrawing	Grunting and/or severe lower chest wall indrawing
Pulse oximetry (SpO_2)	≥92% in room air	<92% in room air	<92% in room air Central cyanosis

Whenever possible, avoid the following in children with COVID-19

- Routine oropharyngeal examination unless wearing full personal protective equipment (PPE, including N95 respirator and eye protection)
- Nebulisers – rather use a metered-dose inhaler (MDI) with spacer
- Non-steroidal anti-inflammatory drugs (NSAIDs) & oral steroids
- High-flow nasal cannula (HFNC) oxygen therapy
- Minimise nasal or oral suctioning and bag-mask ventilation

- If required, non-invasive continuous positive airway pressure (CPAP) or bilevel positive airway pressure (BiPAP) should preferably be delivered in a negative pressure PICU or high-care isolation cubicle by staff with full PPE (including N95 respirator and eye protection)

C. CLINICAL SERVICE PLANS

1. Paediatric critical care

PAEDIATRIC INTENSIVE CARE AND HIGH CARE FACILITIES' AND RESOURCES DURING THE COVID-19 PANDEMIC (WESTERN CAPE).

AC Argent

Background

Prior to the onset of the COVID-19 pandemic the following information was available regarding Paediatric intensive care (PICU beds) in the Western Cape. Full policy statements are available in the appendices (relating to policies developed and signed off at a Provincial level in 2015 for high care beds – Appendix 1), and also more recently for PICU admission policies (Appendix 2).

It is important to note that intensive care services to children can be both elective and emergency related. The outcomes in general are particularly high with very low mortality (e.g. cardiac surgical outcomes may be <5% particularly if elective)

1) **PICU Bed Numbers:**

   a. **Red Cross War Memorial Children's Hospital:**
   22 funded PICU beds at the Red Cross War Memorial Children's hospital (there are spaces and equipment available for up to 29 patients, but these are currently not staffed). For most of the year the bed occupancy is in excess of 85%, and there are times when patients are refused elective surgery because of lack of bed space.

   These beds are used for neonatal, paediatric and paediatric surgical patients (including all the subspeciality services and burns patients). The annual turnover is approximately 1450 patients per annum with a mortality rate of approximately 6%

   b. **Tygerberg Children's Hospital:**
   10 beds that are equipped and staffed. These beds are used primarily for paediatric and paediatric surgical patients, with limited numbers of paediatric surgical subspecialist services. Approximately 700-800 patients are admitted each year. Mortality rates vary between 7 and 10%

   c. **Regional hospitals**
   There are "high care" areas at other hospitals such as Paarl, Worcester, George hospitals that are actually intensive care areas. None of those beds are specifically allocated by children, but at times there may be up to 6 children in those beds (some will be transferred to other centres, but some will complete their treatment there)

   d. **Private hospitals**
   There are paediatric ICU beds at the Chris Barnard Hospital, which are used primarily for paediatric cardiothoracic patients, and for patients in the private sector who required mechanical ventilation.

2) Paediatric high care beds

It is important to highlight that the description of "high care" in adult and paediatric services are different. We have highlighted the specific services available.

a. Red Cross War Memorial Children's Hospital

A total of 39 high care beds were identified in the hospital.

8 neonatal high care beds (these are physically equipped to allow monitoring and if necessary full ventilatory support, they are staffed to all monitoring and potentially high flow or nCPAP support for neonates).

31 high care beds spread through the hospital in oncology, cardiology, tracheostomy service and paediatric wards, paediatric surgical wards, burns unit and trauma unit. Approximately 50% of these beds are equipped and staffed to allow the administration and monitoring of non-invasive ventilatory support. During the surge season each year the high care areas have to expand in the medical wards to accommodate up to 12-15 patients on non-invasive ventilatory support at any one time.

b. Tygerberg Children's hospital

There are 4 neonatal high care beds in the hospital

There are 4 step-down beds (don't take acute admissions) and 6 tracheostomy beds

In G ground and G7 there are 4 beds that have been designated as high care. May have up to 6 patients on high flow and nCPAP at any one time.

In B wards there are 6 high care beds (beds with monitors and space)
In specialist wards there are no designated high care beds, but there are sometimes 6-10patients on high flow and nCPAP.

There are some single spaces in the infectious disease area that could be used as isolation areas in a COVID pandemics.

c. Regional hospitals

There are patients at Paarl, Worcester and George hospitals that receive nCPAP and high flow in the paediatric wards, but without allocation of high care beds.

There are 1-2 patients at a time who may receive high flow humidified nasal oxygen at Somerset Hospital. This is not a designated high care area.

COVID-19

Direct Impact on child health

The literature from around the world suggests that there is not a significant upsurge in the number of children who require high care and intensive care during the COVID-19 pandemic. However, we do have to be aware that the age profile of the population in South Africa is different to that in countries where reports on the pandemic originate from. It is possible that we may be worse affected.

Indirect impact

It is of concern that if children with health problems have delayed access to health services, the number of children requiring high care and intensive care may increase. It is also possible that the wider socio-economic implications of the pandemic will increase the needs for high and intensive care.

The pressures of the pandemic on staff availability for clinical services are also unpredictable and may at some stage substantially reduce the resources available for paediatric high and intensive care.

The process of caring for COVID-19 infected patients (and their families) may take longer as a consequence of all the processes related to testing, screening, use of Personal Protective Equipment (PPE) etc., and this may effectively reduce the number of patients who can receive services within the system.

Timelines

The current numbers in the high care and intensive care areas suggest that the pressures on the services are relatively quiet at the moment. This may well change dramatically over the period following the end of the national lockdown process.

Although the characteristics of the pandemic are not known, and the timeframe of the process is still unpredictable, it is likely that there will different phases ranging from low impact, to very high impact and finally to longer term impact. However, the usual pressures related to the birthrate; the presence of neonatal and congenital problems in infants and children; the incidence of complex problems which may at some stage require high and intensive care (in areas such as oncology; nephrology; cardiology etc.) will not reduce over the period.

Allocation of resources

There is an extensive literature regarding the appropriate allocation of resources for intensive care beds, but there is limited material providing for the relative allocation of paediatric and adult healthcare services, particularly during a pandemic period. A recent publication from the Royal College of Paediatrics and Child Health has highlighted an ethical framework for the allocation of resources to children during this period.

This relates to the different phases of demands on the services.

Recommended Approach to high care and critical care services for children

1) While pressures on services are not high, we should continue to provide as much elective intensive care to children as possible (this means that surgical processes should continue as far as possible)
2) If pressures are on services increase, we could then narrow the range of surgical services that are regarded as "elective". This may be challenging particularly as there are many conditions where delay in surgery will result in higher risk to patients (and staff) and increased use of scarce resources.
3) If pressures increase further, we would need to move to emergency care only in the high care and intensive care areas.
4) we may need to reduce critical care services for children, but here the relative benefits of intensive care for adults and children have to be taken into account. The predicted outcomes for adults requiring mechanical ventilation for COVID-19 related disease are relatively poor (50% or higher mortality with significant utilization of resources), while the existing outcomes for children are generally much better (shorter duration of intensive care and higher survival)
5) We will have to consider the management of children currently under intensive care with poor expected outcomes where we need to increase the levels of palliative care.

2. Maternal and Newborn

GUIDANCE ON COVID-19 AND MATERNAL AND NEWBORN CARE[1]

A. Managing the pregnant woman during the COVID-19 pandemic- A clinical guide for health workers and clinical managers

COVID-19 and Pregnancy

Epidemiology in Pregnancy:

Pregnancy is a physiological state that predisposes women to respiratory complications of viral infection. Due to the physiological changes in their immune and cardiopulmonary systems, pregnant women are more likely to develop severe illness after infection with respiratory viruses.

However, pregnant women do not appear to be more susceptible to the consequences of COVID-19 than the general population and do not appear to be at increased risk for severe disease. Current data is limited and diligence in evaluating and treating pregnant women is warranted. Special consideration should be given to pregnant women with comorbid medical conditions and COVID-19 until the evidence base provides clearer information. There are no reported deaths in pregnant women yet.

Over and above the impact of COVID-19 on a pregnant woman, there are concerns relating to the potential effect on fetal and neonatal outcome; therefore, pregnant women require special attention in relation to prevention, diagnosis and management. (To date, no cases of vertical transmission)

Transmission: .

No vertical transmission has been documented. The virus has not been isolated from cord blood or amniotic fluid. Expert opinion is that the fetus is unlikely to be exposed during pregnancy. Any transmission to the neonate is therefore most likely to be after delivery, through close contact with the mother or other infected people. The virus has not been found in the breastmilk of mothers with COVID-19 infection, so for now breastfeeding is not thought to be a route of transmission

Presentation in pregnancy:

There is currently no known difference between the clinical manifestations of COVID-19 in pregnant and non-pregnant women or adults of reproductive age.

Effect on the Mother:

The majority of women will experience only mild or moderate cold/flu like symptoms. Cough (67.8%), fever (43.8% of cases on admission and 88.7% during hospitalization), and shortness of breath are other relevant symptoms (diarrhoea is uncommon (3.8%).
More severe symptoms such as pneumonia and marked hypoxia are widely described with COVID-19 in older people, the immunosuppressed and those with chronic medical conditions such as diabetes, hypertension, cancer and chronic lung and heart disease. Within the general population there is evolving evidence that there could be a cohort of asymptomatic individuals or those with very minor symptoms that are carrying the virus, although the incidence is unknown.

[1] *This summary is based on a combination of available evidence and expert opinion. This is an evolving situation and this summary is a living document that may be updated if or when new information becomes available.*

Effect on the Fetus:

There is currently no data suggesting an increased risk of miscarriage or early pregnancy loss in relation to COVID-19. As there is no evidence of intrauterine fetal infection with COVID-19 it is currently considered unlikely that there will be congenital effects of the virus on fetal development.

There are case reports of preterm birth in women with COVID-19, but it is unclear whether the preterm birth was iatrogenic, or whether some were spontaneous. Iatrogenic delivery was predominantly for maternal indications related to the infection. There were a few reports of fetal compromise and pre-labour premature rupture of membranes.

Fever is common in COVID-19-infected patients. Previous data from other studies have demonstrated that maternal fever in early pregnancy can cause congenital structural abnormalities. However, a recent study in non-COVID-19 women, reported that the rate of fever in early pregnancy was 10%, and the incidence of fetal malformation in this group was 3.7%. Previous studies have reported no evidence of congenital infection with SARS-CoV, and currently there are no data on the risk of congenital malformation when COVID-19 infection is acquired during the first or early second trimester of pregnancy.

Investigation and Diagnosis:

The process of COVID-19 testing and diagnosis is changing rapidly. Pregnancy does not alter the criteria for testing.

Pregnant women should be investigated and diagnosed as per local criteria: www.nicd.ac.za and www.ndoh.gov.za

Prevention:

Currently, there are no effective drugs or vaccines to prevent COVID-19. There are however several interventions that can prevent spread of the virus and confer protection from acquiring the virus.

- Any person with symptoms suggestive of the disease should be advised to and should take responsibility to isolate themselves from others. They should additionally wear a face mask. They should phone their local health facility or the National COVID-19 helpline (0800 029 999) to enquire about whether they should be tested for COVID.
- Maintain good personal hygiene.
- Personal protective equipment (PPE) must be used by those working in the health care environment according to local guidelines.
- Citizens must abide by National “lock down” regulations.

Notes on Clinical Management

For pregnant women the same infection prevention, investigation and diagnostic guidance applies, as for non-pregnant adults.

1. COVID-19 infection is not an indication for delivery, unless delivery is required as part of maternal resuscitation to improve maternal oxygenation, or to restore haemodynamic stability.
2. COVID-19 infection is not an indication for caesarean delivery. Women with COVID 19 infection should be allowed to deliver vaginally, unless there are clear obstetric indications for caesarean section. (WHO recommends that caesarean section should ideally be undertaken only when medically justified).

3. Shortening the second stage by assisted vaginal delivery can be considered if the woman is exhausted or has respiratory distress.

4. For suspected and confirmed cases of COVID-19 infection, intrapartum care, delivery and immediate postnatal care should be conducted in an appropriate isolation room. There must be dedicated midwives allocated to care for the woman and her newborn. These midwives must not be involved with managing other women in labour on the same shift. **Appropriate personal protective equipment (PPE) must be worn by the midwives caring for the COVID 19 patient.**

5. Induction of labour is not routinely indicated for women with COVID 19, but should be performed for appropriate obstetric indications.

6. Where preterm delivery is anticipated, there is a need for caution with the use of antenatal corticosteroids for fetal lung maturation in a critically ill patient, because steroids could potentially worsen the mother's clinical condition. The use of antenatal steroids should be considered in discussion with a multidisciplinary team (infectious disease specialists (where available), specialist physician, specialist obstetrician, maternal-fetal-medicine specialists (where available) and neonatologists). WHO- in cases where the woman presents with mild COVID-19, the clinical benefits of antenatal corticosteroid might outweigh the risks of potential harm to the mother. In this situation, the balance of benefits and harms for the woman and the preterm newborn should be discussed with the woman to ensure an informed decision, as this may vary depending on the woman's clinical condition, her wishes and that of her family, and available health care resources.

7. In the case of an infected woman presenting with spontaneous preterm labour, tocolysis should not be used in an attempt to delay delivery in order to administer antenatal corticosteroids.

8. Products of conception from miscarriages or terminations of pregnancy and placentas of COVID-19-infected pregnant women should be treated as infectious tissues and they should be disposed of appropriately.

9. Delayed cord clamping is still recommended following birth, provided there are no other contraindications. The baby can be cleaned and dried as normal, while the cord is still intact. COVID-19 has not been isolated from cord blood.

10. Newborns to mothers with suspected or confirmed COVID-19 should routinely be kept together with the mother for bonding and breastfeeding, with the mother applying necessary precautions for IPC (the mother should wear a mask and wash or sanitize her hands frequently). If possible, the mother/baby pair should continue to occupy the same isolation room used by the mother during labour. Otherwise, they may need to be transferred to an alternative isolation ward, but will still require appropriate postnatal/neonatal care.

11. For women expressing breast milk, hands must be washed before expressing. A dedicated breast pump/milk cups should be used. Follow recommendations for breast pump cleaning after each use (Rinse all expressing equipment in clean, running water before sterilizing). Consider asking someone who is well to feed expressed milk to the baby (Mother can decant milk from her container into a clean container held by a healthy person to prevent transmission via the containers surface).

12. All newborn of women with suspected or confirmed COVID-19 need careful assessment at birth and monitoring, with referral to or consultation with the next level of expertise in selected cases. All babies will need neonatal follow-up and ongoing surveillance after discharge.

13. Routine neonatal criteria for admission to the neonatal nursery/NICU will apply. Expressed breast milk would be ideal for the baby in this situation, if the mother is not able to enter the neonatal nursery due to infection concerns.

14. If the mother is unwilling to breastfeed the baby or is unable to breastfeed the baby because she is critically ill, then arrangements for the baby to be taken home for care by the family should be investigated.

15. When mother with COVID-19 and baby are both fit for discharge, they can be discharged home as long as home circumstances will allow self-isolation of the mother/baby pair. If this is not possible, referral to an alternative isolation/quarantine unit may be necessary.

16. For PUIs, every attempt must be made to obtain a COVID-19 test result before discharge to clarify isolation requirements post-discharge.

17. The postnatal visit schedule must be arranged before discharge. Discharge must be authorized by a senior team member. On discharge, the mother with COVID-19 must be provided with contact details of the relevant postnatal/neonatal care team member to call if she has any concerns before her next scheduled visit. The postnatal/neonatal team should also obtain contact numbers for the mother, so that telephonic follow-up can be conducted if required.

18. For symptomatic relief or fever or headache, paracetamol is recommended. There are some concerns (not proven) that non-steroidal anti-inflammatory drugs, specifically ibuprofen, may worsen the course of COVID-19, and they should therefore not be used as first-line treatment for symptomatic relief.

FACILITIES AND INFRASTRUCTURE

Maternity and reproductive health services during the COVID-19 pandemic: Guidelines for provincial, district, facility and clinical managers

Non-emergency, but essential services that need to continue at the usual level of care during COVID pandemic:

- Contraception services (there may be a need to postpone some sterilization procedures; where this is the case reliable contraception must be offered)
- Termination of pregnancy services
- Antenatal care, including BANC Plus and high-risk antenatal clinics
- Elective caesarean sections
- Postnatal care (includes review of both mother and baby)
- Gynaecological oncology services including colposcopy and LLETZ procedures, surgery for gynaecology cancers
- Immunisation (including influenza vaccine for pregnant mothers and routine immunisation for babies)

The exceptions are when the woman is:

1) A confirmed COVID-19 case*

2) A person under investigation (PUI) for COVID-19 (symptomatic)*

3) A contact of a confirmed case*

*Refer to latest NICD case definitions

In such situations, the required non-emergency service can be postponed as follows:

1) Confirmed case: until 14 days after the onset of symptoms (mild disease) or 14 days after stabilization of the condition (severe disease)

2) PUI: until COVID-19 is excluded, or if COVID-19 is confirmed, then until 14 days after onset of symptoms (mild disease) or 14 days after stabilization of the condition (severe disease)

3) Contact: until 14 days have passed since the last contact occurred, and no symptoms have occurred.

Services that can be postponed during a lock-down period:

- Elective gynaecologic surgery
- Non-emergency, non-oncology gynaecology clinics
- Visits for routine pap smear screening (opportunistic pap smear screening can still be done if the woman has presented for an essential service such as antenatal care, contraception or antiretroviral treatment review)

Emergency services that need to continue at the usual level of care during the COVID pandemic:

- Intrapartum care, including vaginal births
- Emergency caesarean sections
- Management of any obstetric emergency
- Management of gynaecological emergencies, including those related to early pregnancy

When such cases present, the woman must be screened for COVID-19 symptoms. Confirmed or suspected COVID-19 cases must be assessed for severity of disease. Cases with severe COVID-19 will need referral to a designated centre with expertise and facilities to manage severe COVID-19. Cases with mild disease can be managed in isolation at the usual level of care, with consultation as required with the next level of care.

Systems that need to be in place

- Contraception services must be accessible at all health care facilities. For women of reproductive age, the issue of family planning should be raised during all non-emergency health care interactions (not limited to maternity or gynae departments). Avoiding unplanned pregnancies is of particular importance during the pandemic, and those planning for a pregnancy should be advised to consider deferring their plans until the pandemic is over.
- All Pregnant or post-partum women, especially those who are COVID-19 cases or PUIs should have access to a COVID-19 phone number/WhatsApp number through which they can contact their antenatal/postnatal clinic to discuss COVID-19 related care issues such as whether or not they should attend for scheduled visits. The relevant number must be provided to the woman at her first antenatal visit
- All facilities must also provide pregnant and postpartum women with the number for the NDOH COVID-19 WhatsApp support line (0600 123456) and the COVID-19 emergency Helpline (0800 029 999): Women should be advised that through the support line they can access a **COVID-19** community messaging system for information, advice about self-care, support and addressing queries. These are also available in different formats and languages on the SidebySide (www.sidebysideva.org) or the Perinatal Mental Health Project (https://pmhp.za.org)

- The antenatal and postnatal clinic must ensure they obtain contact details (address and preferably multiple phone numbers) for any pregnant woman who is a COVID-19 case or PUI. If these women are not admitted, then regular (e.g. weekly) telephonic follow-up should be conducted to plan the further management of the pregnancy with the woman (e.g. providing COVID-19 test results, scheduling of further antenatal visits, checking that there is no clinical deterioration)
- All health facilities must have a process of screening all outpatients for COVID-19 before or as they arrive at the facility. The facility must be able to provide surgical face masks for patients who screen positive, to be worn during all further interactions at the facility.
- All facilities must have a designated isolation area, where outpatients (including pregnant women) that screen positive on arrival can be thoroughly assessed through history-taking and clinical examination, to determine whether the patient meets the criteria for COVID-19 testing, and to plan further care, where necessary in consultation with or with referral to a higher level of expertise.
- All primary health care facilities must have a functional 24/7 communication system with the obstetric doctor at their direct referral hospital for consultations regarding further management of COVID-19 cases or PUIs in pregnancy (e.g. using VULA App, WhatsApp, phone).
- All designated birthing (delivery) sites should be able to identify potential COVID-19 cases, test for COVID-19, identify patients with severe COVID-19 disease and be able to manage intrapartum care (in an isolation room) in COVID-19 patients with mild disease. The District management should consider closing the birthing service at any low-volume birthing site (<50 births per month) in an urban (non-remote) area which cannot meet these requirements (there will need to be a minimum of 2 midwives working in labour ward on any shift). The birthing service for that community would then be consolidated at a better resourced neighbouring facility, with consideration of transfer of some midwives and/or doctors to the neighbouring facility to support the increased case burden there.
- Unless there are obstetric reasons for admission, pregnant or post-natal COVID-19 cases/ PUIs **with mild disease**, or asymptomatic contacts of confirmed COVID cases should self-isolate at home. Where this is not possible, due to the home circumstances, the pregnant woman should have access to a designated isolation/quarantine facility, where she can stay until she tests negative or has passed the 14-day infectious period. If her next scheduled ANC /PNC visit falls within this isolation period, there needs to be telephonic or WhatsApp communication with the clinic to reschedule this visit.
- Facilities with waiting mothers' areas (maternity waiting homes- MWH) for pregnant women at term who have no means of transport to get to the facility when they go into labour, must ensure that appropriate infection prevention control (IPC) measures are enforced amongst the occupants of the MWH to minimise the chance of spread of the virus (hand-washing, social distancing etc). If a woman has COVID-19 or is a PUI, or has a confirmed contact, then she cannot be admitted to the MWH until infection has been excluded. The antenatal care provider must individualise a plan for the woman, e.g. admission for isolation in hospital, admission to a quarantine/isolation facility or self-isolation at home and admission to the MWH once the infectious period has passed.
- Pregnant women who are COVID-19 cases or PUIs, not in labour, who require admission to hospital, will need to be nursed in an isolation unit within the hospital. This could either be in a section of the hospital identified for all COVID cases or PUIs, or in an individual cubicle within the maternity unit. Irrespective of the site, clear plans need to be made regarding the frequency of nursing observations and doctor's and/or midwife's rounds required. This will vary according to the gestational age and the reason for the admission.

- Pregnant or post-partum patients with confirmed or suspected COVID-19 with severe disease, in septic shock or in respiratory distress, should be referred as soon as possible for inpatient care at a designated specialised COVID-19 treatment site with high-care and ICU facilities and a multi-disciplinary specialist team.
  Where such patients present at a primary health care site, there must be direct transfer to the designated specialised COVID-19 treatment site, bypassing the interval levels of care (the interval level of care may have a role in telephonically assessing the severity of the case and facilitating transfer through communication with the specialised COVID-19 treatment site).

  All hospitals must be aware of where their referral centre is for patients with severe COVID-19. Hospitals must have a functional 24/7 communication system with the relevant doctors at this referral centre (e.g. using VULA App, WhatsApp, phone).

- Labour in women who are COVID cases or PUIs should be managed at the appropriate level of care based on existing risk factor criteria. Any woman with severe COVID-19 should be referred directly to the designated specialised site for managing severe COVID cases.
  The COVID-19 case or PUI in labour must be managed in an isolated cubicle, by dedicated staff who cannot be assigned other duties for non-COVID-19 patients during the same shift.

- If a woman who is a COVID-19 case or suspect needs an emergency caesarean section, it should ideally be done in a designated theatre room exclusively reserved for COVID-19 cases. This may not be feasible at most hospitals and is not essential. If the theatre air conditioning system is functional, a break of 30 minutes is required after the COVID case has left the theatre before the next case enters. This break will also allow mandatory decontamination of surfaces in theatre according to IPC guidelines. The recovery monitoring of the COVID-19 patient post-operatively should be done in the theatre room, not the recovery room (unless there is a dedicated recovery room for COVID-19 patients). When the patient is assessed as being well enough to leave the theatre, she must be transferred straight out of the theatre complex, bypassing the recovery room. Regular training drills must be conducted and documented so that all relevant staff are aware of the procedures and cleaning protocols.
- Post-delivery, if the baby is well, the mother and baby can be nursed together in isolation, preferably in the same cubicle where the mother delivered, with the same staff in attendance, unless the cubicle is required for a new woman in labour. Breastfeeding is encouraged.
- Discharge home should only be allowed after careful planning for care of mother and baby after discharge. This may require a longer post-delivery stay in-facility than for non-COVID mother/baby pairs
  For PUIs awaiting COVID-19 test results, the result should be obtained before the mother/baby pair is discharged, as this will clarify the necessary arrangements for post-discharge care.

  For confirmed cases, if the mother is well enough to manage in self-isolation with the baby at home, and her home circumstances are suitable for this, then she can be discharged, as long as contact can be maintained by the hospital or post-natal clinic via phone or WhatsApp. The alternatives are to keep the mother/baby pair in isolation in a designated section of the facility or to refer to a designated isolation/quarantine facility until the period of infectious risk has passed.

- All health care workers should have access to a staff wellness programme for support, including COVID-19 testing, due to high levels of anxiety from working in this environment.
- All cases of PUI need to be documented and confirmed COVID-19 cases need to be notified.

What is expected at each level of care for management of maternity and reproductive health services during the COVID-19 pandemic

Antenatal clinics, BANC+ sites

- Safe working conditions for all staff, including appropriate personal protective equipment (PPE) for all staff according to PPE guidelines.
- Staff should receive regular (e.g. weekly) updates on the COVID-19 statistics, any new protocols and training on how to manage COVID-19 at their level of care. Simulation training (fire drills) is encouraged.
- Screening of all outpatients on arrival (brief history and temperature check).
- Isolation cubicle for thorough assessment of those who screen positive, and for making initial management plan.
- Testing for COVID-19, or clear referral route to testing site.
- Clear referral criteria to higher levels of care for obstetric risk factors and complications.
- Clear protocols on managing COVID-19 or suspected COVID-19, including referral criteria to higher levels of care or to isolation/quarantine facility.
- Direct access to consultation with Obstetrics and gynaecology doctor at referral hospital (via Vula App/cellphone/WhatsApp)
- Either direct access or access via doctor at referral hospital, to doctor at specialised COVID hospitals (for severe COVID cases) and to doctor at isolation/quarantine facilities for those with mild disease or contact history who cannot self-isolate at home.
- Direct access for ANC/PNC patients to a senior staff member in the maternity department of the facility (via cellphone/ WhatsApp) for COVID related queries (especially regarding scheduling of appointments).
- For COVID cases, PUIs and contacts of confirmed cases, who are to be managed through self-isolation at home, the clinic must ensure contact details are obtained and that a system of routine follow-up via phone/WhatsApp is in place.
- Access to EMS transport able to transfer COVID-19 patients

All designated birthing (delivery) sites, including Midwife-run Obstetric Units (MOUs):

All of the above (as for BANC clinics), plus:

- Isolation facility for managing a COVID patient or suspect during labour, delivery and immediate post-natal period.
- Adequate midwife and nurse staffing to allow dedicated staff (at least 1 midwife and 1 other nurse per shift) exclusively allocated to the care of the COVID-19 patient in labour and her newborn.
- For the woman in labour, a companion of her choice should be encouraged, due to the many proven obstetric and mental health benefits, but can only be allowed under the following conditions:
    - The woman in labour is not a COVID-19 case or a PUI.
    - The companion has been screened for COVID-19 on arrival at the facility and is screen negative.
    - The companion has been instructed about and is willing to comply with infection prevention precautions, including those that have been put in place because of the COVID-19 pandemic.

- The infrastructure of the labour ward allows for the companion to avoid close contact with any other patients in the ward.
- The presence of the companion is not prohibited by any other local (provincial) regulation put in place for the COVID-19 pandemic.

Hospital with maternity service:

All of the above (for PHC clinic and delivery site), plus:

- Isolation facility for managing a pregnant or postpartum COVID-19 patient, or PUI, who needs inpatient care for non-COVID-19 reasons (e.g. pre-eclampsia). This could either be within the maternity complex or in a general ward designated for isolating COVID-19 patients. For each patient in this category there will need to be an individualized plan made and reviewed daily for frequency of observations required and frequency of ward rounds to be conducted by the obstetric doctor and/or the midwife.
- The operating theatre complex must have a functional air conditioning system with an adequate number of air exchanges per hour according to hospital standards to ensure that the virus would be cleared from the air following surgical cases involving patients with COVID-19.
- The hospital requires an isolation area within the neonatal nursery to care for a sick baby delivered from a mother with COVID-19

Specialised COVID-19 Hospital:

This is a hospital designated to receive referrals, from other facilities in a defined catchment area, of patients with COVID-19 (or PUIs) with severe features (particularly patients in septic shock or respiratory distress due to COVID-19). Requirements:

- Safe working conditions for all staff, including appropriate personal protective equipment (PPE) for all staff according to PPE guidelines.
- Referral criteria for accepting severe COVID-19 patients or PUIs.
- ICU and High-care facility available for COVID-19 patients.
- Specialists with the necessary skills to manage the COVID-19 patient with severe features
- Multi-disciplinary team including midwives, specialist obstetrician, specialist neonatologist and specialist anaesthetist for co-managing pregnant woman with severe COVID-19 and her newborn.

Isolation/Quarantine Facility:

This is a facility to which people can be referred, from other facilities within a defined catchment area or from the community, for the purpose of isolation. Such a facility will take in people, including pregnant women and postpartum women with their newborn, who are well enough to be managed as outpatients but who need to be kept in isolation to reduce the risk of their transmitting COVID-19 to other members in the community. These would be people whose home circumstances make it impossible for them to self-isolate or self-quarantine at home. They would include asymptomatic people who have been in close contact with a confirmed COVID-19 case (see NICD case definition of a contact), as well as people with COVID-19 or PUIs with mild disease not requiring in-patient care. The facility could either be a designated section of a health facility, or a facility which has been entirely designated for isolation/quarantine purposes for the period of the COVID-19 pandemic.

Requirements:

- Safe working conditions for all staff, including appropriate personal protective equipment (PPE) for all staff according to PPE guidelines.
- Isolation facilities for multiple individuals including pregnant women and postpartum mother/baby pairs.
- Admission criteria and protocols for managing the isolation period.
- On-site doctor.
- Clear referral criteria and pathway for obstetric/neonatal complications.
- Direct access to consultation with obstetrician and neonatal doctor at referral hospital (via Vula App/cellphone/WhatsApp).
- Clear protocols on managing COVID-19, including referral criteria to specialised COVID-19 hospital.
- Direct access to doctor at specialised COVID-19 hospitals (for consultation and referral of COVID-19 cases who develop severe features)
- Access to EMS transport able to transfer COVID-19 patients for those who need transfer to another facility for obstetric or neonatal problems or for COVID-19 –related complications,

Guideline on Clinical Management

- The COVID-19 pandemic places most pregnant and postnatal mothers and their families under considerable social, economic and psychological strain. Many women will be at increased risk for food insecurity and domestic violence. Although staff too are likely to be highly stressed and deserve care, their engagement with mothers should always be respectful and empathic.
- For pregnant women the same infection prevention and COVID-19 investigation/ diagnostic guidance applies, as for non-pregnant adults.
- For staff attending to pregnant woman with COVID-19 or PUIs, the same personal protective equipment (PPE) requirements apply as when attending non-pregnant adults with COVID-19. As with all pregnancies, irrespective of COVID-19 status, particularly during labour, there are risks of staff exposure to blood, urine, faeces and amniotic fluid. Routine infection control measures as required for managing all pregnancies and deliveries must therefore be strictly adhered to. However, staff can be reassured that the virus has not so far been detected in amniotic fluid or in breastmilk.
- For symptomatic relief or fever or headache, paracetamol is recommended. There are some concerns (not proven) that non-steroidal anti-inflammatory drugs, specifically ibuprofen, may worsen the course of COVID-19, and they should therefore not be used as first-line treatment for symptomatic relief.
- COVID-19 is not an indication for delivery, unless it is felt that delivery is required as part of maternal resuscitation to improve maternal oxygenation, or to restore haemodynamic stability.
- COVID-19 is not an indication for caesarean delivery. Women with COVID-19 should be allowed to deliver vaginally, unless there are clear obstetric indications for caesarean section.
- Shortening the second stage by assisted vaginal delivery can be considered if the woman is having respiratory distress.
- Do not monitor the fetal condition in a woman with severe COVID-19. The priority is stabilizing the mother’s condition. The presence of the fetal heart can be checked intermittently in such cases.
- For asymptomatic women or those with mild disease, standard fetal monitoring guidelines apply, taking into consideration any obstetric risk factors

- Induction of labour (IOL) is not routinely indicated for women with COVID-19, but should be performed for appropriate obstetric indications. The decision for IOL should involve an experienced obstetric doctor, to ensure that the IOL is definitely indicated. Where possible, it would be better to avoid labour and delivery until the woman has recovered from the COVID-19
- Women scheduled for elective caesarean sections, who have contracted COVID-19 should if possible have the caesarean section postponed until 14 days after the onset of COVID-19 symptoms. PUIs should wait for the test result before a decision is made on the timing of the caesarean section. The postponing of elective caesarean sections should be overseen by an experienced obstetric doctor, to ensure that it is safe to do so, and to determine an appropriate monitoring/review schedule for the mother while awaiting the new date.
- For suspected COVID-19 cases (including recent contacts of a confirmed COVID-19 case) and confirmed cases of COVID-19, intrapartum care, delivery and immediate post-natal care should be conducted in an appropriate isolation room. There should ideally be two dedicated midwives allocated to care for such a woman and her newborn (if this is not possible, then at least one midwife and a nurse), and these midwives must not be involved with managing other women in labour on the same shift. Appropriate personal protective equipment (PPE) must be worn by the midwives and nurses caring for the COVID-19 patient.
- Where preterm delivery is anticipated, there is a need for caution regarding the use of antenatal corticosteroids for fetal lung maturation in a critically ill patient, because steroids could potentially worsen the mother's clinical condition. Ideally the use of antenatal steroids should be considered in discussion with a multidisciplinary team (infectious disease specialists, maternal-fetal-medicine specialists and neonatologists). A general guide is that a course of steroids can be given where there is mild COVID-19, but should be avoided when there is severe COVID-19
- In the case of woman with COVID-19 presenting with spontaneous preterm labour, tocolysis should not be used in an attempt to delay delivery in order to administer antenatal steroids.
- Although the virus has not been isolated from umbilical cord blood or amniotic fluid of pregnancies where the mother has COVID-19, products of conception from miscarriages or terminations of pregnancy and placentae of women with COVID-19 should nonetheless be treated as infectious tissues and be disposed of using appropriate infection control practices
- The COVID-19 virus has not been isolated from cord blood. Delayed cord clamping is still recommended following birth. The baby can be cleaned and dried as normal, while the cord is still intact.

When caesarean section (CS) is required for the woman with COVID-19, the following guidelines apply:

- Birth partners should not accompany the patient in the theatre complex
- Platelet count should always be checked in preparing for the CS. NOTE: Approximately one third of patients in a case series from Wuhan developed thrombocytopaenia (platelet count <150). This may have implications both for the anesthetic and for the surgery
- Early warning for the senior anaesthetist of an impending caesarean section is essential in order to facilitate preparation of theatre and PPE.
- Where possible, a senior anaesthetist should administer the anaesthesia. This is aimed at reducing theatre time, reducing the incidence of failed spinal anaesthesia and potentially reducing aerosol generation during intubation, if required.
- The surgeon should also be at senior level in order to reduce the risk of operative complications and prolonged surgery, and thereby reducing the incidence of conversion of spinal anaesthesia to general anaesthesia.

- The surgeon, surgical assistant, scrub nurse and midwife (receiving baby) must wear full PPE, including an N95 mask and goggles or visor.
- Anaesthesia for these patients may be either regional or general anaesthesia (GA), as for non-COVID-19 patients. However, GA, which for CS requires endotracheal intubation, creates a greater risk for virus transmission to staff in theatre and for viral contamination of the theatre. If the anaesthesia machine is used either for a GA or for administration of supplemental oxygen, a hydrophobic filter must be used to prevent the machine being contaminated with the virus (≤ 0.05µm pore size).
- Spinal anaesthesia remains the anaesthetic of choice in the absence of contra-indications. The patient should be wearing a surgical facemask for the duration of the perioperative period.
- Where spinal anaesthesia is used the airway theatre trolley should be prepared as for a GA. Two sets of intubation PPE: N95 mask, goggles or visor and two pairs of non-sterile gloves should be available on the trolley. An alcohol based hand sanitizer should be available. In the event of a "stable" conversion to GA, the anaesthetist should don full PPE for intubation whilst the assistant monitors the patient. The anaesthetist should return in full PPE and the assistant should then don PPE. Before proceeding, ensure all staff in the operating theatre are wearing PPE. Induction of anaesthesia should be performed and surgery commence/ restart after the airway is secured. In patients at high risk for GA conversion, PPE should be donned before the initiation of spinal anaesthesia.
- Donning PPE is mandatory for tracheal intubation; double glove if intubating the patient and remove the outer gloves once the endotracheal tube is secured. See SASA guidelines: https://sasacovid19.com.
- Tracheal intubation is a high-risk procedure for staff, irrespective of the clinical severity of the disease. Where possible, video-laryngoscopy should be used as first-line. Avoid face mask ventilation unless needed.
- Failed spinal guidelines:
- i) Senior anaesthetic advice should be sought in the event of a failed spinal. If the clinical circumstances permit, a second attempt at spinal anaesthesia is preferred within current ESMOE guidelines. These state that if there are no effects of the failed spinal within 20 minutes, a repeat spinal anaesthetic may be administered. In the event of partial effects, surgery should either be delayed for six hours or converted to GA. If delayed surgery is chosen, a repeat failed spinal anaesthetic should be converted to GA. Conversions to GA should be done within the current SASA guidelines for GA in the COVID-19 positive patient. ii) Where the need to deliver the baby is very urgent, either for fetal or maternal reasons, the perioperative team may make a decision to proceed straight to an urgent GA. In this event, the assistant and anaesthetist should remove gloves and sterilize hands with alcohol. N95 should be applied along with double gloves. Induction and intubation should proceed with all due speed. No induction should occur without all staff in the theatre having first donned PPE.
- Consider neonatal resuscitation outside the operating theatre where possible. This may reduce exposure of the baby and staff resuscitating the baby to aerosols, and potentially minimize the unnecessary use of PPE.
- A combination of paracetamol and an opiate should be routinely used as first-line for post-operative pain relief in the woman with COVID-19. Local anaesthetic around the incision is an additional option. Concerns regarding the use of NSAIDs in the Covid-19 positive patient are not yet proven by clinical data. Accordingly, NSAIDs may be used with caution in the absence of other contraindications, on an individual patient basis

- Well newborns of mothers with suspected or confirmed COVID-19 should routinely be kept together with the mother for bonding and breastfeeding, with the mother applying necessary precautions for IPC (mother should wear a mask and wash or sanitize her hands frequently.)
- For PUIs, every attempt must be made to obtain a COVID-19 test result before discharge to clarify isolation requirements post-discharge. The postnatal visit schedule must be arranged before discharge. On discharge, the mother with COVID-19 must be provided with contact details of the relevant postnatal/neonatal care team member to call if she has any concerns before her next scheduled visit. The postnatal/neonatal team should also obtain contact numbers for the mother, so that telephonic follow-up can be conducted if required
- Routine neonatal criteria for admission to the neonatal nursery/NICU will apply when the mother has COVID-19. Expressed breast milk will be important for the baby in this situation, if the mother is not allowed to enter the neonatal nursery, due to infection control restrictions
- If the mother is unwilling to breast feed the baby or is unable to breast feed the baby because she is critically ill, then arrangements for the baby to be taken home for care by the family should be investigated.
- If the mother is unable to breastfeed the baby because she is critically ill, sourcing donor breast milk for the baby should be attempted.

3. NEONATAL SERVICES: STANDARD OPERATING PROCEDURE

TITLE	***Neonatal medical team ACTION PLAN for Covid exposed(CE) deliveries and immediate postnatal care***				
REFERENCE NUMBER					
INSTITUTION		Directorate: Neonatal Unit			
ISSUE DATE		7 April 2020			
NUMBER OF PAGES		7 (page 7 Appendices)			
ISSUED BY		Directorate: Neonatal Department			
ORIGINAL AUTHOR OF SOP		Dr AM van Niekerk, Neonatal Team at Mowbray Maternity			
Certification of Due process:		_____ Authority /Delegate Date			
Approval Date		**Commencement Date:**		**Review Date**	
RECORD OF AMENDMENTS:		Will be amended if case load increases			
DATE:	17/4/2020	**AREA AMENDED:**	Well baby definitions, Covid testing, Documentation outside isolation areas, theatre, delivery suite		
DATE:		**AREA AMENDED:**			
OBJECTIVE: Neonatal structured ACTION Management plan at Covid Exposed infant deliveries.					
RESPONSIBILITY: Neonatal medical team					
POLICY: Western Cape DOH					
References & source material	***-Senior Neonatal Medical team*** -SOP: Management of Persons Under Investigation or Confirmed Case of NCoV-2019 (Coronavirus) Requiring Surgery, Sr H Engelbrecht, Sr C Hammond				
Definition of Terms & Concepts	***NNU:*** *Neonatal Unit;* ***MO:*** *Medical Officer;* ***LW****: Labour Ward* ***PUI:*** *Person (any age) under investigation for Covid19: i.e. has* ***sufficient risks to warrant testing.*** *(Affirmed by NCID/Western Cape Virology Laboratory Testing hotline)* ***CE:*** *Covid-19 Exposed Newborn (mother confirmed or suspected, PUI.)* ***PPE****: Personal Protective Equipment* *(****Full PPE****: Gown, N95 mask, goggles/visor, cap gloves;* ***Standard(Std) PPE****: Apron, surgical mask, gloves)* ***AGP's****: aerosol-generating procedures: Any respiratory support (invasive and non-invasive,) intubation, less invasive surfactant administration (LISA), extubating, suctioning,* obtaining oropharyngeal & nasopharyngeal swabs. **#Baby well:** Implies a clinically well term or near-term infant, >35wks, >1,8kg, not meeting current nursery admission criteria for any neonatal issue. Also includes well, asymptomatic babies admitted purely because of maternal reasons: transfer to ICU/ gynae side/ social. **#Baby unwell:** Implies any neonatal medical or surgical condition requiring NNU admission.				
Tools, Materials & Equipment	• *Neonatal resuscitaire, resuscitation trolley, equipment, medication.* • *Neonatal doctor's PPE pack (Appendix 1* • *Additional essential equipment: Dedicated stethoscope, measuring tape, Clinell wipes (Appendix 2)* • *Neonatal stationary pack (Appendix 3)*				
Safety Warnings	• *Always don full PPE when dealing with Covid positive/ PUI patient in delivery suite or if AGP anticipated.* (Intubation, extubation, LISA and a General Anaesthetic considered HIGH RISK). Don full PPE with all CE babies on respiratory support in isolation cubicle. • *For routine management of "well" Covid exposed infant in nursery, may use surgical mask (rather than N95), apron, gloves unless any AGP anticipated.* • Designated delivery attending doctor (Senior Medical Officer): Don &doff in theatre/ delivery suite designated area. • Designated retrieval doctor (NICU doctor) dons and doffs in NICU isolation cubicle. • Once done, wash hands thoroughly, ideally make your way to an on-call room in nursery ->shower, redress if practically possible.				

NB: NEONATAL CONSULTANT TO BE NOTIFIED IMMEDIATELY IF ANY COVID POSITIVE PREGNANT MOTHER/PUI ADMITTED. NEONATAL TEAM TO BE NOTIFIED A.S.A. LABOUR/ EXPECTED DELIVERY.

THEATRE:

Health care personnel pre-delivery preparation: Neonatal nurse, theatre sister responsible

- Ensure the Neonatal team (Paediatric MO) & NICU are informed early!
- Check the Neonatal doctor "full PPE" pack (Appendix 1) available.
- Check all newborn resuscitation and ***other essential equipment*** available. (Appendix2)
- Check 1 ***Neonatal stationary pack (see below)*** available outside theatre, in recovery. (Appendix 3)
- Ensure that a separate dedicated incubator is available and switched on.

Neonatal Health care personnel at delivery: Neonatal (anaesthetic) nurse and neonatal senior MO

- A doctor assigned to attend suspected/confirmed COVID-19 deliveries for that day, to be informed immediately.
- NICU staff to be informed early, to ensure isolation space available, warm incubator and prepare.
- Minimize people in theatre / Labour ward. Attending doctor should don PPE in an adjacent room and **wait outside the theatre, ready to be called in should the baby require any intervention(s).**
  Can also start filling in clerking notes from obstetric folder available outside theatre.
- Neonatal resuscitation/stabilisation should proceed as per standard guidance.
- **INITIAL NEWBORN EXAMINATION AND DOCUMENTATION**: ***All documentation to stay outside theatre***
  If baby well, not for NNU admission, >1,8kg, >35wks:
  - neonatal doc was **not** called in to theatre: doctor examines, complete investigations in recovery area, then doff in specified area and document all in notes.
  - - neonatal doc was called into theatre: examine and do Investigations in theatre if possible, then handover to the nurse taking mother and baby to the designated ward. Doff in theatre and then complete all documentation outside.
  If baby for NICU admission:
  - - neonatal doc was called into theatre: examine and do investigations in theatre if practical before the **verbal handover** to the NICU registrar fetching the baby, then doff in theatre. Complete clerking notes after doffing. The ***NICU senior doctor designate***, who donned in NICU 2 cubicle, and brought down the closed incubator, receives the physical and verbal handover, transfer baby to NICU, stabilises, completes clinical assessment and investigations outstanding. Doffs in NICU Isolation cubicle, then helps complete the documentation.
- **NEONATAL TRANSFER**: Theatre will have "spare" dedicated COVID transport incubator if NICU incubator not immediately available.
  Baby well, going to Postnatal ward:
  Safe transfer to mom's isolation room (C ward), in skin to skin position (mom to wear a mask, hand hygiene and ideally chest hygiene done). OR
  Baby well, to be admitted: *(NICU staff to be made aware all requirements needed with incubator sent down: full O2 cylinder, regulator, flow meter, tubing, nasal cannulae, Ambubag and appropriate size mask. Pulse oximeter and new probe. No humidifier.)* NICU to send down dedicated patient incubator and NICU senior doctor designate**:** dons in nursery cubicle, goes down, receives baby from theatre. Safe transfers in patient's own dedicated closed incubator with floor nurse to NICU isolation cubicle. OR
  Baby requiring respiratory support or unwell: *(NICU staff to be made aware all requirements needed with incubator sent down: O2 cylinder, regulator, flow meter, tubing, nasal cannulae, Ambubag and appropriate size mask. Pulse oximeter and new probe. No humidifier.)* NICU to send down dedicated patient incubator and NICU senior doctor designate: Dons upstairs, receives baby from theatre and accompanies baby and floor nurse from recovery area to NICU isolation cubicle. NICU senior doctor designate with 1 donned NICU staff member, stabilizes infant, completes all investigations. Doffs in isolation cubicle.

NB: Neonatal consultant to be notified immediately if any Covid Positive pregnant mother admitted. Neonatal Team to be notified a.s.a. labour/ expected delivery.

LABOUR WARD(LW): ***"LOW RISK ROOM"*** = Room Identified as designated Covid room:

Health care personnel pre-delivery preparation: Neonatal nurse, LW sister responsible

- Ensure the Neonatal team (Paediatric MO) & NICU are informed early!
- Check adequate "full PPE" packs available for Neonatal team (Appendix 1) in case intubation needed.
- Check all newborn resuscitation and ***other essential equipment*** (Appendix 2) available.
- Check 1 ***Neonatal stationary pack*** (Appendix 3) available outside designated LW room.
- Ensure that a separate dedicated incubator is available and switched on.

Neonatal Health care personnel at delivery: Neonatal nurse and neonatal team doctor

- A doctor assigned to attend suspected/confirmed COVID-19 deliveries for that day, to be informed immediately.
- NB NICU staff to be informed early, to warm dedicated incubator and prepare.
- Pink person to don PPE in an adjacent room and **wait outside the delivery room, ready to be called in should the baby require any intervention(s).**
  Also: start filling in clerking notes from obstetric folder available outside designated delivery room.
- **If pink person called in:** If available: Draw screen between resuscitaire and mother's bed.
- Neonatal resuscitation/stabilisation should proceed as per current guidance. Ideally screen off area.

- **INITIAL NEWBORN EXAMINATION AND DOCUMENTATION**: ***All documentation to stay outside theatre***
  If baby well, not for NNU admission, >1,8kg, >35wks:
  - Neonatal doctor was **not** called in to delivery room: Pink person examines baby, completes investigations if needed: ideally outside the LW room, (or at least behind a screen if inside) then doff in specified area and document all in notes.
  - Neonatal doctor was called into delivery room: examine and do Investigations in LW room (if possible screened off from the mother) then handover to the nurse taking mother and baby to the designated ward. Doff in delivery room and complete all documentation outside.

  If baby for NICU admission:
  - Neonatal doctor was called into LW room: examine and do investigations in LW room (if possible screened off from the mother) if practical before the brief verbal **handover** to the NICU registrar fetching the baby, then doff in theatre. Complete clerking notes after doffing. The ***NICU senior doctor designate*** , who donned in NICU 2 cubicle, and brought down the closed incubator, receives the physical and verbal handover, transfer baby to NICU, stabilises, completes clinical assessment and investigations still outstanding. Doffs in NICU Isolation cubicle, then helps complete the documentation.

- **NEONATAL TRANSFER**: LW should have a "spare" dedicated COVID transport incubator if NICU incubator not immediately available.
  Baby well, going to Postnatal ward:
  Safe transfer to mom's isolation room (C ward), in skin to skin position (mom to wear a mask, hand hygiene and ideally chest hygiene done). Ensure examination and investigations done pre-transfer OR
  Baby well, to be admitted:
  NICU to send down dedicated patient incubator and NICU senior doctor designate dons in nursery, takes down incubator, receives baby from LW room. Safe transfers in patient's own dedicated closed incubator with floor nurse to NICU isolation cubicle, complete any outstanding investigations, pre-doffing. Complete documentation. OR
  Baby requiring respiratory support or unwell: *(NICU staff to be made aware all requirements needed with incubator sent down: O2 cylinder, regulator, flow meter, tubing, nasal cannulae, Ambubag and appropriate size mask. Pulse oximeter and new probe. No humidifier.)* NICU to send down dedicated patient incubator with all equipment and NICU senior doctor designate Dons upstairs, receives baby from LW room and accompanies baby and LW floor nurse to NICU isolation cubicle. NICU senior doctor designate with 1 donned NICU staff member, stabilizes infant, completes all investigations. Doffs in isolation cubicle, then completes documentation.

AFTERHOURS: ON CALL delivery ACTION PLAN

NB: Neonatal Medical Officer in NICU, Senior Registrar and Consultant on call to be NOTIFIED immediately if any Covid positive pregnant mother/ PUI admitted in labour and when delivery expected.

1. Senior Registrar(SR) on call will have to come in, attend NICU (with consultant back up).

2. Doctor to attend delivery (full PPE) and clerk baby if possible. Note: all documentation kept outside theatre/ delivery suite. **NB: Start filling in clerking notes from obstetric folder available outside designated delivery room, pre- being called in.**
   Once done: doff in theatre or delivery suite ->complete clerking notes -> shower, redress-> take over in NICU again.

3. NICU senior doctor designate: don in nursery, receive baby and transfer baby to NICU2 isolation cubicle and with neonatal nurse. In NICU: Complete stabilisation of baby with the help of NICU nursing staff, complete all required procedures and investigations.
   Once done: doff in isolation cubicle->Complete documentation. Ideal: shower if necessary, may leave once all settled.

NOTE: If baby "well" and no NICU isolation cubicle available: doctor to complete all investigations, clerking necessary, admit to designated NNU area in baby's own incubator.

POSTNATAL WARD NEONATAL CARE: Well babies with Covid positive mother/PUI

1. If newborn is assessed as well and sent with mom to the Postnatal isolation ward AND
   The detailed first baby examination and all documentation is completed by Paediatric MO pre- transfer.
   -> This infant does not need to be seen again by a neonatal doctor unless issues reported.
2. Mother to practice infection control principles (wash hands and breasts with soap and water and don mask before any infant contact).
3. Nursing staff attending should encourage and assist breastfeeding. (post mother hand, breast washing and mask)
4. If infant not in KMC or breastfeeding with mother (wearing mask), should be transferred to a closed incubator/ cot ideally >1meter from bed.
5. If infant <2kg or <36wks, a closed incubator next to mother's bed is needed.

Routine nursing observations to be done including:

6. On Arrival observations: Temperature. Post CS: 6hr sats monitoring.
7. Breastfeeding(BF) assistance and assessment NB (advise mother to wash hands and breast and wear mask)
8. Dextrostix if infant high risk: Cold; small(<2,5kg); large (>4kg); premature(<37wks); poor feeding.
   -> Dxstix 3hrly until 2 x ≥2,6, then stop).
9. TCB at 6hrs, if >80: TSB and start phototherapy, rpt TSB next day. Discuss with paediatric doctor if >50 above PV.
   If <80: TCB if looks yellow or daily on day 2,3, pre-discharge unless had phototherapy: needs TSB
10. Daily BF observation, temperature and ask mom if any concerns. Note if urine and stool passed yet.
11. Day 3 weight and daily weight thereafter.
12. Any concerns: Please discuss with the Neonatal Medical Officer**,** who may need to don full PPE and see baby in cot in isolation area, ideally 2metres from bed.

Note: No Covid testing of a "**well CE baby**"[#], in postnatal isolation ward

POST-NATAL NEONATAL UNIT CARE:

Important points:

Where to admit: Into a closed incubator (fetched from theatre or delivery recovery area in his/her incubator)

- All Covid Exposed (CE) infants to ideally initially be admitted to NICU isolation cubicles 1-6 in a closed incubator. (If isolation cubicles full -> discuss with consultant: consider transfer to designated NNU CE room, especially if not requiring respiratory support. (A designated CE room to be opened depending on available resources). *If ventilation/ therapeutic hypothermia/ open incubator anticipated: ideally isolate in NICU isolation cubicles 5/6.*
- Once stable, not requiring respiratory support, could be moved in their own closed incubator to designated NNU CE area (ideal: old Mothers room).
- If well, term infants (Boarder: Social case/ mother ill, transferred)- can be admitted immediately in their own closed incubator to NNU CE area once room open.

PPE:

All Deliveries and initial stabilization of all CE infants should be done with full PPE (including N95).
Once stabilized AND no aerosolized generating procedure anticipated: may be nursed with routine PPE (apron, gloves and a surgical mask.
Face masks:
1. Surgical masks are the standard mask to be used for PPE when providing patient care.
2. Filtering face masks (N95 masks) should be prioritized for use by health care personnel when performing procedures that increase their exposure to respiratory aerosols (aerosol generating procedures) which includes intubation, extubation, suctioning, obtaining oro-/nasopharyngeal swabs, induced sputum and all forms of ventilation (noninvasive and invasive) as well as at delivery or receiving infant from theatre/ delivery suite.
(PPE donning sequence is: hand hygiene->gown->N95 mask-> goggles-> cap-> gloves over gown sleeves).
Once infant stable, no respiratory support: Hand hygiene and std PPE (Apron, surgical mask, gloves)

Covid-19 Testing:

- No early routine Covid testing of CE newborns.
- No testing of a "**well CE baby**"[#], in postnatal isolation ward/ NNU, not admitted for neonatal criteria.
- If CE baby admitted for a neonatal reason: Test baby once we know mother is Covid positive, ideal: 72hrs & 48hrs later
- If CE infant still an in-patient after 2wks (e.g. Prem) consider retesting at 2-3wks (discuss with senior)
- Covid Test an initial "well" CE baby only if becomes unwell with a respiratory illness/ any suspicious Covid presentation. (Consult senior).
- Test any admitted infant presenting late with a very Covid-specific suspicious presentation (respiratory illness not following usual neonatal illness course, rash, edema, unexplained GIT symptoms etc.). Discuss with Consultant.

Attending staff to wear full PPE whilst testing. Virology should be informed. Testing is via nasopharyngeal and oropharyngeal (throat) swabs into a special viral transport medium (VTM), obtained from the virology lab.

Breastfeeding and breastmilk advice:

Well baby with mom in isolation in postnatal ward: Encourage Breastfeeding. Mom to wear a mask with all infant contact and practice proper handwashing and wash breasts prior to breastfeeding.
Infants admitted to the neonatal unit: May not breastfeed, since the mother will be unable to visit the infant until 14 days after the period of acute illness ends. However, mothers may still express breastmilk and have the postnatal isolation ward nurse disinfect exterior of container and send up to nursery/ once mother is discharged: via a well family member to deliver the milk to the front desk for exterior disinfection and collection. Advise the use of a mask and careful hand, breast, equipment and container hygiene with expressing.

Visitation rules:

In-patient mothers will not be allowed to visit their infants in the Unit for the duration of their hospital admission as current recommendations are that mothers should be cared for in an isolation room for the entirety of their hospital stay.

Out-patient, well mothers may only visit with telephonic permission, once we have confirmed she is >14days since her confirmed or suspected Covid-19 diagnosis and acute illness. She will be required to wear a facemask always in the neonatal unit and adhere to strict handwashing protocol.
Other visitors: With our current SA lockdown, no OUTSIDE visitors except a well mother (>14ds post-acute illness/ Covid19 investigation) will be allowed to visit mother or baby unless exceptional circumstances and discussed with senior team.

Discharge and follow up plans:

Post-natal ward neonatal patients:

When infant and mother are ready for discharge, they should be provided with written advice regarding what to look out for, in terms of respiratory symptoms, lethargy or poor feeding, and from whom to seek further advice should they have concerns. They should be advised to self-isolate for a minimum of 14 days.

Neonatal Unit patients:

Discharge can be discussed with senior: When infant and mother are ready for discharge, they should be provided with written advice regarding what to look out for, in terms of respiratory symptoms, lethargy or poor feeding, and from whom to seek further advice should they have concerns. They should be advised to self-isolate for a minimum of 14 days.

Note: In well term or near-term infants: A case by case a risk/ benefit discussion may be needed between medical team and the families to individualize care in babies that may be more susceptible to COVID-19 infection or may be considered safe for isolation and care at home. ***Babies that are well and can be safely discharged, whose mothers are unable to take care of them due to severity of illness, should be discharged into the care of a well non-quarantined family member if possible.***

Families to receive follow-up advice regarding:

A. Ideal: Minimum 14day self-isolation at home post illness or exposure.
B. Usual neonatal danger signs, where to go or who to call if concerned.
C. Good hygiene, hand washing, social distancing principles.
D. If warranted, (e.g. small/premature) routine MOU appointment post 14day isolation to be given.
E. Importance and responsibility of Covid transparency if presenting at any other health facility.

-Please keep a register of all exposed cases: data capturing sheet.
-Inform the "remote" High Risk follow up team of these patients and ensure adequate contact details.
-Do a CBS referral if appropriate and high risk.

APPENDIX 1:

Neonatal PPE pack: **Responsible person:** Theatre, LW, NICU area managers

1. Waterproof Gown
2. N95mask
3. Goggles
4. Cap
5. Gloves

Need 1 in Theatre, 1 in Labour Ward Designated Delivery Suite, 2 in NICU isolation cubicles.
NB Daily check must be done by area managers

APPENDIX 2: **Responsible person:** Theatre, LW, NICU area managers

Other essential equipment IN & OUTSIDE THEATRE, IN AND OUTSIDE DELIVERY SUITE
(besides full resuscitation and emergency trolley equipment)

1. BOX CLINELL WIPES INSIDE AND OUTSIDE to wipe down pen, calculator, foot-length callipers, stethoscope once completed notes, pre-doffing PPE.
2. Dedicated MEASURING TAPE
3. Dedicated STETHOSCOPE

APPENDIX 3: **Responsible person**: Neonatal designated Pink person for that day

Neonatal "Covid-19 neonatal stationary pack" x 3:
Total of 2 packs needed: One OUTSIDE theatre, delivery suite and NICU isolation cubicle:
Pages:

1. Infant record card
2. Apgar slip
3. Neonatal clerking note (double sided 4pages),
4. Neonatal Postnatal Ward daily checklist (double sided 2 pages),
5. Extra continuation sheets (2),
6. Ballard scoring chart (double sided 2page)
7. Prescription board
8. Results sheet
9. ABG (gas) result sheet
10. Prescription sheet
11. HIE Scoring sheet
12. PMTCT Infant Discharge letter
13. HIV PCR slip
14. TTO form
15. Social work Referral form
16. Laboratory Request forms x2

Other:
-BLACK PEN x2
-CALCULATOR
-FOOTLENGTH CALIPERS

3.

4. MANAGEMENT OF CHILDREN WITH COVID-19[2]

OUTLINE:

1. Introduction & epidemiology
2. Challenges
3. Clinical manifestations (including laboratory & imaging features)
4. Case definition
5. Testing for SARS-CoV-2
6. Case classification & disease severity
7. Organisation of health care facilities for children with suspected & confirmed COVID-19
8. Emergency medical services (EMS) transport of suspected & confirmed covid-19 paediatric & neonatal patients
9. Management of suspected & confirmed cases
10. Personal protective equipment
11. De-isolation
12. Appendices 1-7

1. INTRODUCTION & EPIDEMIOLOGY

Our current understanding of the SARS-CoV-2 infection resulting in coronavirus disease-2019 (COVID-19) is that the vast majority of individuals with severe disease that need hospitalization and intensive care are adults. The Department of Health's response is focused on preventing primary infection and strengthening adult and critical care services. The evidence regarding the disease in children is rapidly evolving. Children have accounted for less disease and less disease severity compared to adults but asymptomatic or mildly symptomatic children are likely to contribute to transmission of infection to others.

Paediatricians must support this effort to expand adult healthcare services but, in addition, we need to make adequate provision for the care of SARS-CoV-2 exposed and infected newborn babies and children while maintaining optimal routine care for all children.

The current understanding of disease severity is that:

- Children account for fewer persons presenting with COVID-19 disease than adults:
  - 2% are <19 years of age
  - <1% are <10 years of age

- Children have less severe COVID -19 disease than adults and current data suggest that approximately:
  - 4% are asymptomatic
  - 51% have mild disease
  - 39% have moderate disease

[2] *Adapted from KwaZulu-Natal Department of Health: Provincial Plan for the Management of Children with COVID-19: N McKerrow, M Archary, M Morgan, P Jeena*

Current contributors to this version: H Rabie, A Redfern, N Rhoda, S Salie, J Nuttall

- 5% have severe disease
- <1% have critical disease requiring ventilation
- Deaths are rare
- Children are infected at home and early post-partum mother-to-child transmission can occur
    - 82-90% of infected children report a household contact

Plans for the management of COVID-19 in children therefore need to provide guidance on inpatient outpatient, intensive care management and transport of:

- babies born to mothers with COVID-19 or asymptomatic SARS-CoV-2
- children with suspected COVID-19
- children with confirmed COVID-19 / SARS-CoV-2
- Children living with adults with COVID-19 / SARS-CoV-2

2. CHALLENGES

There are at least 5 significant challenges in developing a response to COVID-19 in children:

1. Unknown number of infected children: there is no certainty regarding how many children will be infected or, more importantly, how many will have moderate or severe disease requiring admission to hospital or critical care services. Services therefore need to be developed with the worst-case scenario in mind.

2. Delay in diagnostic confirmation of COVID-19: There is both limited laboratory capacity and a substantial turnaround time to receive the results, this time may increase significantly for rural hospital where delays in delivering specimens may contribute further to this lag. A significant number of children with suspected infection will need to be managed as though they are infected.

3. Emergency Medical Services (EMS): There are a finite number of ambulances with a limited capacity to transport children between healthcare facilities. In addition, children with COVID-19 may present particular infection prevention and control challenges to EMS. Services to manage COVID-19 in children need to be created in all healthcare facilities and EMS capacity should be reserved for the transfer of sicker children to higher levels of care.

4. Home isolation: The living circumstances of most children in the province are poor and the ability to implement safe or effective home isolation is extremely limited. As a result, a large proportion of children with suspected, asymptomatic or mild disease will not be able to self-isolate at home and provincial health departments will need to create safe spaces for families to self-isolate together.

5. Imminent seasonal respiratory syncytial virus (RSV) and influenza: Winter is associated with RSV and influenza season amongst children. Increased admission rates for lower respiratory tract infection due to one or both of these organisms is likely to increase the requirement for COVID-19 testing.

3. CLINICAL MANIFESTATIONS (INCLUDING LABORATORY & IMAGING FEATURES)

The clinical manifestations of COVID-19 in children are similar to that in adults.

Clinical pattern

Asymptomatic.

General features: fever (42 – 50%), poor feeding, fatigue, headache.

Respiratory: pharyngitis (45%), cough (38 – 48%), rhinitis (8%), shortness of breath.

Gastrointestinal: diarrhoea (9%), vomiting (6%).

Special investigations

Special investigations and imaging should not be done if there is no specific indication, particularly in mild disease. In moderate and severe disease, investigations to identify or exclude alternative causes of respiratory illness may be needed and include, but are not limited to, respiratory viral PCR panel, blood culture, HIV testing, GeneXpert and culture for TB.

Full blood count	White cell count	normal or reduced with reduced neutrophil & lymphocyte counts
	Platelet count	reduced
Inflammatory biomarkers	CRP	normal / low except in severe disease
	PCT	normal / low
Liver enzymes	LDH	may be abnormal in severe disease
Clotting	D-dimers	increased in severe disease
Imaging	Chest X-ray	bilateral patchy nodular / speckled ground-glass opacities

4. CASE DEFINITION

The case definition of COVID-19 is likely to change over time as the epidemic progresses.

Criteria for person under investigation (PUI), i.e. a person to be tested for SARS-CoV-2 (adapted from NICD, 9 April 2020):

Acute respiratory infection with sudden onset or history of fever (>38°C) **AND** at least one of the following:

- Cough
- Sore throat
- Shortness of breath

Children at highest risk (MUST be tested) (adapted from NICD, 9 April 2020):

Acute respiratory illness AND who in the 14 days prior to onset of symptoms:

- Had close or household contact with a confirmed COVID-19 case **OR**
- Had close or household contact with a health care worker who works in a facility where COVID-19 patients are being treated **OR**
- Anyone in the household with a flu-like illness or pneumonia

Definition of terms:

[1] Close contact: A person having had face-to-face contact (≤1 metre) or in a closed space with a COVID-19 case for at least 15 minutes. This includes, amongst others, all persons living in the same household as a COVID-19 case and, people working closely in the same environment as a case. A healthcare worker or other person providing direct care for a COVID-19 case, while not wearing recommended personal protective equipment or PPE (e.g., gowns, gloves, NIOSH-certified disposable N95 respirator, eye protection). A contact in an aircraft sitting within two seats (in any direction) of the case, travel companions or persons providing care, and crew members serving in the section of the aircraft where the case was seated.

[2]Confirmed case: A person with laboratory confirmation of SARS-CoV-2 infection (using an RT-PCR assay), irrespective of clinical signs and symptoms. Symptomatic cases are considered infectious from 2 days before symptom onset to 14 days after symptom onset.

[3]Probable case: A PUI for whom testing for SARS-CoV-2 is inconclusive (the result of the test reported by the laboratory) or who tested positive on a pan-coronavirus assay.

5. TESTING FOR SARS-CoV-2

At the present time, testing for SARS-CoV-2 at health care facilities is only indicated for symptomatic patients

Refer to **Appendix 1** for details on collection of various respiratory samples used for testing, transportation of samples to the virology laboratory and forms that must be completed and accompany the sample to the virology laboratory.

It is essential that the person collecting respiratory samples makes use of appropriate personal protective equipment (PPE) and has been trained in the correct process for putting on ("donning") and taking off ("doffing") PPE. Refer to **Appendix 2** for details, including a video demonstration link.

6. CASE CLASSIFICATION AND DISEASE SEVERITY

Simplistically there are six categories of children infected or affected by COVID-19:

1. Uninfected
2. Suspected infection
3. Newborns of SARS-CoV-2 infected mothers (suspected or confirmed)
4. Asymptomatic / mild disease

5. Moderate disease
6. Severe disease.

Table 1. Criteria for the classification of the severity of respiratory disease (not all criteria are required in order to be classified in a certain category)

	Mild	**Moderate**	**Severe**
Mental status	Normal	Restless	Irritable/lethargic
Feeding	Finishes feed	Does not finish feed	Unable to feed
Talking	Full sentence	Interrupted sentence	Unable to talk
Respiratory rate (breaths/min)	<40 if under 1yr <30 if 1 – 5 years <20 if over 5 years	40-60 if under 2 months 40-50 if 2 – 12 months 30-40 if 1 – 5 year 20-30 if over 5 years	>60 if under 2 months >50 if 2 – 12 months >40 if 1 – 5 year >30 if over 5 years
Respiratory signs	No distress	Lower chest wall indrawing	Grunting and/or severe lower chest wall indrawing
Pulse oximetry	≥92% in room air	<92% in room air	<92% in room air Central cyanosis

Visualisation of the upper airway (routine ENT examination) should be avoided, and if required (e.g. upper airway obstruction suspected to be due to adeno-tonsillar hypertrophy or suppurative conditions including retropharyngeal or peritonsillar abscess) should preferably be performed by an ENT specialist or senior paediatric staff member with full PPE including a N95 respirator and eye protection (Refer to **Appendix 2**).

7. ORGANISATION OF HEALTH CARE FACILITIES FOR CHILDREN WITH SUSPECTED & CONFIRMED COVID-19

SARS-CoV-2 can spread in the healthcare setting affecting other patients, adult caregivers and staff.

It is important to provide daily screening of staff and adult caregivers who are in hospital with any child with a COVID-19 symptom questionnaire and temperature screen using a thermal scan. Adults accompanying children with COVID-19 should preferably not be elderly or have significant co-morbid illness.

In order to prevent hospital transmission patients should be isolated and cohorted and PPE used appropriately. Refer to Appendix 3 for an overall management algorithm taking account cohorting and severity of disease.

As there are three broad groups of children, each hospital needs to create THREE in-patient areas, one for each category:

1. **Non-COVID-19 children**
2. **Suspected COVID-19 children (PUI's)**
3. **Confirmed COVID-19 children**

Each area needs to be totally separate and enclosed with its own equipment and staff. Ablutions should ideally be separate, or bed pans used if separation is not possible.

Where children and adults will be screened and/or PUI's cohorted together in the same area, provision should be made for appropriate paediatric emergency equipment and staffing in the screening area. Consideration should also be given to the provision of high-care for very sick children that could be in any of the three categories (i.e. hospitals providing high-care to children will need to have high-care beds in each of the three categories).

Options for creating three areas include:

- Dedicated cubicles in a children's ward – if the ward has cubicles.
- Dedicated children's wards – if the hospital has 2 or more children's wards.
  If there are 2 children's ward it is suggested that one is used as a non COVID-19 ward and the other as a COVID-19 ward split into two sections – suspected and confirmed.
- Dedicated hospital COVID-19 wards for both adults and children
  In this circumstance it is important that:
    - Children are preferably placed IN THE SAME ROOM AS A PARENT in a female ward or
    - Are accommodated together in a single cubicle/corner/section of the ward.

  The relative size and number of beds in each area will change as the South African epidemic evolves. The preferred option will therefore be dictated by the structures of the facility and the number of children needing accommodation.

  In light of the imminent RSV and influenza season the number of suspected paediatric cases is expected to be high and any impulse to use underutilized children's wards for adult services should be avoided.

1. **Uninfected**
   Children requiring admission for any non-respiratory illness MUST be kept apart from children with suspected or confirmed SARS-CoV-2 infection unless they have a strong epidemiological risk factor e.g. close contact of a confirmed COVID-19 case, in which case they may be an asymptomatic carrier and should be cohorted separately or with other PUIs.

2. **Suspected infection (PUI)**

Every child with an acute respiratory infection;

Apply a face cover, preferably a surgical mask, to the child and caregiver to cover the nose and mouth;

Place in an isolation room / separate area in OPD / A&E. If none is available keep apart from other patients;

Assess severity of disease (mild, moderate or severe as per Table 1 above);

Test for SARS-CoV-2 infection – wearing PPE and with appropriate precautions (Refer to **Appendices 1 and 2**);

Manage according to severity of disease and level of health care system (**Appendices 3 and 4**):

- Asymptomatic or mild disease can self-isolate at home when home circumstances allow, if not then they must be admitted to the "suspected COVID-19" area in the children's ward.
- Children with moderate or severe disease need to be admitted to the "suspected COVID-19" area of the children's ward.
- If the child needs transferring to another facility for further investigation or care – see Emergency Medical Services (EMS) Section 8

Systems must be established to fast-track the processing of tests by the laboratory of hospitalized children with suspected COVID-19.

Make sure that arrangements are made to check results and provide these to the child's family.

- Children with confirmed SARS-CoV-2 infection can be moved to the "confirmed COVID-19" area.
- Children who test negative for COVID-19 may have been infected during their stay in hospital. If any child with whom they were cohorted had a positive COVID-19 test or test results are outstanding, then they:
    - Must remain in the "suspected COVID-19 / PUI" area of the ward until discharge.
    - On discharge, must be quarantined for two weeks and perform self-monitoring within their household

3. Newborn babies born to SARS-CoV-2 infected women (suspected or confirmed infection)

Provision must be made in the maternity unit and nursery for the care of pregnant women with COVID-19 and their babies. Nurseries should screen mothers for symptoms. Access to the nursery MUST be restricted and the following people must be excluded: all visitors and non-nursery staff. Mothers with COVID-19 must be accommodated in a safe area. The safety of EMS staff performing transfers of mothers and babies must also be considered and they must be informed about the COVID-19 status of the mother and baby.

There are 3 scenarios that hospitals must prepare for:

- **Delivery and resuscitation;**
- **Well baby of mother with suspected or confirmed COVID-19;**
- **Sick or small baby of mothers with COVID-19**

1. **Delivery and resuscitation**

   Maternity units must establish a dedicated delivery room / suite with a neonatal resuscitaire, access to oxygen (wall outlet or cylinder) and vacuum (wall outlet or portable) and neonatal resuscitation pack including commonly used resuscitation equipment and a pulse oximeter.

   Deliveries that are high-risk for obstetric reasons, should be attended by a senior clinician wearing appropriate PPE (Refer to **Appendix 2**). Management of the baby should be in line with normal neonatal care. The first examination should occur in the delivery room / suite. If the baby needs to be moved to any other unit in the hospital this MUST be done with the baby in a closed incubator.

2. **Well baby**

   All well babies MUST remain with their mother. If mom is unable to care for the baby, he/she should room-in in a closed incubator. Breast feeding is safe and must be encouraged.

   Mom must wear a face cover, preferably surgical mask, and follow strict hand hygiene when holding or feeding her baby.

   When it is not possible for the baby to remain with his/her mother they should be admitted to a closed incubator in a side ward of the nursery and treated as an infected individual with appropriate staff PPE.

   Well babies do NOT require routine COVID-19 tests.

   Baby should be discharged as soon as possible – preferably with mom but if this is not possible then to a family member.

3. **Sick or small baby**

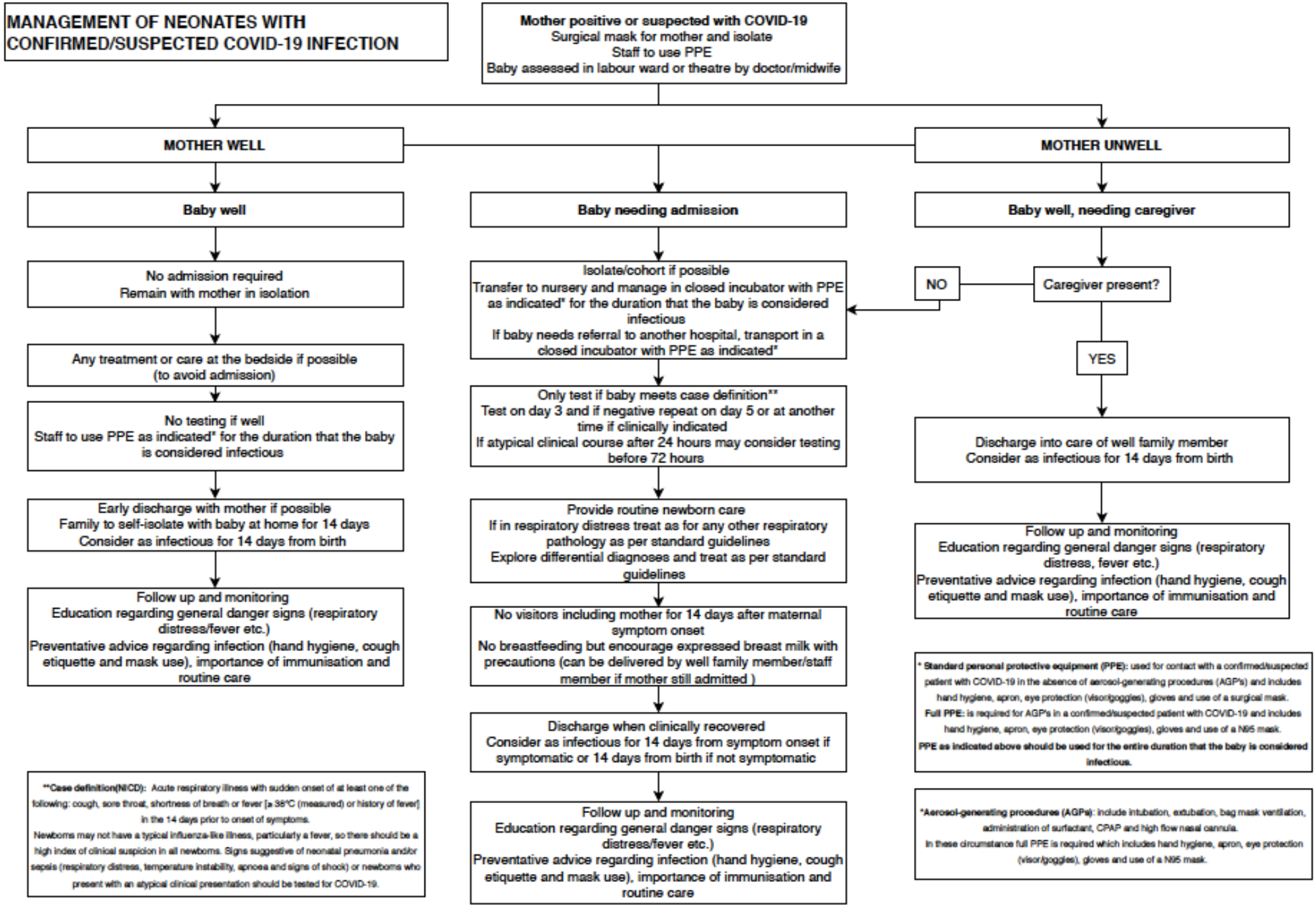
   Avoid admission to the nursery as far as possible so try to give routine additional care (IVI, antibiotics, observations) in the postnatal ward, in a separate room.

   If this is not possible then the baby must be treated as an infected individual:

   - Admitted to an isolation cubicle, side ward or smallest cubicle in the nursery;
   - If the baby and/or mother need to be transferred to another facility, refer to the EMS section for guidance on how to book and prepare for transfer.
   - Perform COVID-19 testing for all sick newborns at 72 hours of age (Refer to **Appendix 1**);
   - Nursed in a closed incubator at ALL times;
   - Designated staff must attend to the baby and they MUST wear PPE at all times (Refer to **Appendix 2**).

   Neonatal management, discharge and follow up must be in line with normal protocols.

MANAGEMENT OF NEONATES WITH CONFIRMED/SUSPECTED COVID-19 INFECTION



****Case definition(NICD):** Acute respiratory illness with sudden onset of at least one of the following: cough, sore throat, shortness of breath or fever [≥ 38°C (measured) or history of fever] in the 14 days prior to onset of symptoms.
Newborns may not have a typical influenza-like illness, particularly a fever, so there should be a high index of clinical suspicion in all newborns. Signs suggestive of neonatal pneumonia and/or sepsis (respiratory distress, temperature instability, apnoea and signs of shock) or newborns who present with an atypical clinical presentation should be tested for COVID-19.

*** Standard personal protective equipment (PPE):** used for contact with a confirmed/suspected patient with COVID-19 in the absence of aerosol-generating procedures (AGP's) and includes hand hygiene, apron, eye protection (visor/goggles), gloves and use of a surgical mask.
Full PPE: is required for AGP's in a confirmed/suspected patient with COVID-19 and includes hand hygiene, apron, eye protection (visor/goggles), gloves and use of a N95 mask.
PPE as indicated above should be used for the entire duration that the baby is considered infectious.

***Aerosol-generating procedures (AGPs):** include intubation, extubation, bag mask ventilation, administration of surfactant, CPAP and high flow nasal cannula.
In these circumstance full PPE is required which includes hand hygiene, apron, eye protection (visor/goggles), gloves and use of a N95 mask.

8. EMERGENCY MEDICAL SERVICES (EMS) TRANSPORT OF SUSPECTED & CONFIRMED COVID-19 PAEDIATRIC & NEONATAL PATIENTS

- **Stable patients 021-937-0500 (normal operational ambulance)**
- **Critically ill patients 021-937-0300 (SPRINT) – all intubated, CPAP, severe cases**

Booking transport – 5-Step Process

When booking transport give EMS control centre the following information:

1. Tell them clearly that the child is a confirmed or suspected Covid-19 patient
2. State if the parent or carer who is accompanying the child is also a confirmed or suspected Covid-19 person
3. Classify into:
    a. Clinically stable – will not require interventions during transport
    b. Clinically unstable – may require interventions during transport

    If you are unsure of how to classify – please discuss with the EMS control centre staff – this may result in a discussion with the EMS doctor on call – who will ascertain risk-level based on potential interventions required during transport
4. Advise of medical equipment requirements e.g. oxygen, route of administration of oxygen, monitoring, syringe driver, infusion pumps, incubator, CPAP, ventilator etc.
5. Give the name and mobile phone number of the healthcare contact person at the facility, who will be able to answer any further questions EMS may have, and who will be notified of arrival time of EMS crew

Receiving EMS & escorting them out of the facility

- Parking must be cleared at the nearest entrance to the patient location
- Ensure the route to & from the patient location is cleared of obstacles
- If a lift is needed to get to the patient – have someone hold the lift and clear other people from the lift area

Preparing the patient & carer

- Patient must be wearing patient ID bracelet
- Place a facemask (or other suitable covering) over the nose and mouth of the patient
- Carer should be informed that EMS in full PPE will be transporting the child
- Carer must be given a facemask to wear during transport
- Ensure all the patient paperwork is ready to go – including referral letter & results
- Have any infusions needed drawn up – with labels on syringes detailing contents and concentration. In addition, please ensure the details (drug name, how many micrograms/milligrams/grams , volume of diluent) of all infusions needed during transfer, are clearly documented in the transfer letter
- If on CPAP place a HME filter on the expiratory limb of the circuit
- If a HME filter has been used on a self-inflating bag, during intubation or resuscitation, for this patient then give the HME filter to EMS to put on their bag

Preparing the receiving facility

- Whenever possible, the receiving facility should have advance warning of the patient's arrival, and should be ready to direct the patient straight to the suspected COVID-19 testing area or suspected/confirmed COVID-19 ward

9. MANAGEMENT OF SUSPECTED AND CONFIRMED CASES

Appropriate supportive management, especially oxygen, improves the outcome of all children with pneumonia. Prompt recognition of pneumonia and supportive care as well as testing for SARS-CoV-2 will allow for appropriate additional care and improve guidance on self-isolation and appropriate use of PPE to ensure staff safety. If the patient needs to be transferred to another facility, refer to the EMS section for guidance on how to book and prepare for transfer.

Mild disease

1. Home care and self-isolation for all children is preferred but if not possible, alternatives outside of the hospital should be considered and as a last resort hospitalization
   Requirements for self-isolation at home include:

   - The whole household should self-isolate
   - Household must practice strict hand hygiene;
   - All high-touch surfaces should be cleaned frequently – at least twice a day
   - Child must be assisted to cover coughing and sneezing
   - Cloth masks should be worn by all family members
   - Child must have own / dedicated household items (cup; eating utensils)
   - Other children and adults must keep a distance of 1-2 metres as much as possible, if possible, use a separate bedroom
   - Use the bathroom last after everyone else, and the toilet (including the outside of the toilet) should be cleaned after use. Flush toilet with the lid down, if possible, use a separate bathroom

2. Supportive care / symptomatic treatment:
   Paracetamol (avoid non-steroidal anti-inflammatory drugs).
   Maintenance fluids and feeds with additional oral rehydration solution (ORS) if child has diarrhoea.

   If necessary, use a metered-dose inhaler (MDI) with a spacer to provide B2-agonists.

3. Caregiver must be given:
   Appropriate information so that they can detect deterioration in the condition of their child;
   Details of whom to contact / how to respond should the child's condition deteriorate;
   A patient information sheet on home care and preventing transmission of SARS-CoV-2 (**Appendix 6**).

Moderate disease

Children with moderate disease MUST be admitted for in-patient care.

1. Supportive care:

Monitor 3 - 4 hourly for respiratory deterioration; reduce frequency once child improving.
Supplementary oxygen using nasal prong oxygen at 2 L/min to keep SpO_2 >92%.
Progress as required from nasal cannula to face mask to face mask with reservoir bag.

If unable to keep SpO_2 > 92% on face mask with reservoir bag re-classify as severe and contact

the designated nearest paediatric high-care unit (HCU) or paediatric intensive care unit (PICU).

Maintenance intravenous fluids: 5% dextrose / 0.9% saline at two-thirds of normal requirements.

Normal maintenance fluids and feeds with additional ORS if child has diarrhoea.

Provide symptomatic relief with paracetamol.

If wheezing, provide B2-agonist with an MDI and spacer, assess response, stop if not responding

2. Procedures / interventions

Try to minimise procedures or interventions that may result in crying or coughing which may increase aerosolization of respiratory secretions. Where possible, try to bundle procedures together e.g. inset nasogastric tube, intravenous cannula and take blood samples at same time as taking respiratory samples for COVID-19 testing while using appropriate PPE (**Appendix 2**). Blood tests only as needed, including arterial blood gases. Capillary gases and pulse oximetry can be used to monitor severity. Avoid nebulization where possible, use metered dose inhaler (MDI) and spacer. Do not share spacers between patients.

3. Treatment:

Antibiotics as per community-acquired pneumonia guidelines.

Amoxicillin 45 mg/kg/dose 12 hourly orally for 5 days; OR

Ampicillin 50 mg/kg/dose intravenously 6 hourly AND Gentamicin 6 mg/kg intravenously daily for 5–10 days.

AVOID:

Corticosteroids

Non-steroidal anti-inflammatory drugs

Severe disease and intensive care for children with severe disease

The same principles regarding supportive care treatment and procedures/interventions described above apply to children with severe disease.

Children with severe disease should be admitted to a paediatric HCU or PICU. Regional HCU/PICU bed occupancy should be monitored to allocate beds as needed.

Children with suspected or confirmed COVID-19 MUST be accommodated apart from those without the infection.

1. Non-invasive respiratory support in children with severe disease (high-flow nasal cannula (HFNC) oxygen and nasal continuous positive airway pressure (NCPAP)

Both HFNC oxygen and NCPAP are considered to be aerosol-generating and as such represent a potential high-risk for transmission of SARS-CoV-2 to health care workers. The indication for HFNC / NCPAP should be carefully considered and initiated only after discussion with a specialist.

All staff working with these patients should wear full protection against airborne transmission

(Appendix 2)

Consider incorporating other measures to mitigate the risk of transmission such as placing an HME filter on the expiratory limb of the CPAP circuit, using the lowest possible flow rate with HFNC oxygen therapy to achieve clinical effect, placing a mask or cloth over the high-flow prongs if tolerated, and isolating the child in a negative pressure / single room where possible.

2. **Intubation** (refer to **Appendix 5**):

Must be undertaken by the most senior member of staff on site;

Full airborne precaution PPE with N95 respirators, full gown and eye protection must be worn (Refer to **Appendix 2**);

Rapid sequence intubation is preferred: Pre-oxygenate with nasal prong O2 and face mask with reservoir – try to minimize/avoid bag mask ventilation

If possible, this should occur under a plastic sheet

Cuffed tubes should be used;

AVOID or minimize suctioning before or after intubation

Use in-line suctioning to limit aerosolization

IV fluids should be restricted to ⅔ of maintenance requirements.

Further ICU management is similar to that for any other child with severe pneumonia.

10. USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE) (Appendix 2)

Appropriate use of PPE should follow institutional/provincial policy.

Each institution should have a detailed plan for the appropriate use and provision of PPE in order to ensure that staff are always adequately protected for the duration of the pandemic.

Many aspects of routine care in children could be considered to be potentially aerosol-generating (see Appendix 2). There is very limited evidence to quantify the risk of viral transmission associated with various procedures/interventions. Risk for an individual procedure is likely to be affected by a number of factors.

As a minimum, all medical, nursing and assistant staff working in suspected or confirmed COVID areas should wear a surgical mask, eye protection, gloves and apron. Face shields which cover the eyes and mask are ideal, as they reduce potential contamination of the mask.

In addition to this, staff working in higher risk areas e.g. on HFNC/CPAP or where multiple aerosol-generating procedures performed, should don N95 respirator and gown (in addition to eye protection and gloves) when going into the room/cubicle.

Good hand hygiene and regular environmental cleaning are key aspects in reducing risk of transmission.

11. DE-ISOLATION

Adults with COVID-19 continue to shed SARS-CoV-2 from their upper airways for 8 – 37 days depending on the severity of their disease – the more severe the disease the longer the period of viral shedding.

Children need to be isolated until they are no longer likely to be shedding virus:

- Asymptomatic children: 14 days from initial positive test
- Mild disease: 14 days from onset of symptoms
- Severe disease : 14 days after they are clinically stable.

Children admitted to hospital can complete their isolation at home once they are well enough to be discharged provided their home circumstances support self-isolation (Refer to **Appendices 3-6**).

APPENDIX 1: TESTING FOR SARS-CoV-2

Principles

- This is an aerosol-generating procedure so use appropriate PPE
- Be calm and gentle, children will be frightened by the process
- Make use of an assistant, preferably the adult that came with the child
- Consider covering the mouth with a mask
- Explain what will happen to care giver and child where appropriate
    - Consider showing children who can understand English the following video before carrying out the collection of the MTNS: https://m.youtube.com/watch?v=HVP8CzDotFI&feature=youtu.be
- Be calm and reassuring, it is not necessary to sedate the child

Types of samples:

- **Mid-turbinate nasal swab (MTNS)** - this is preferred, particularly for younger children
- Nasopharyngeal swab (NPS) or nasopharyngeal aspirate (NPA)
- Sputum
- For intubated patients: tracheal aspirate (TA) or bronchoalveolar lavage (BAL)

Types of swab:

- Flocked (thin plastic or wire) are preferable but often unavailable
- Normal dry pus swab (asses the nostril size): tip to be cut off or broken off and placed into tube with viral transport medium or if unavailable into a dry sterile container e.g. CSF tube (not the gel-containing tube)
- Sputum, NPS, NPA, TA and BAL do not require viral transport medium and may be submitted to the laboratory in a sterile container

Procedure

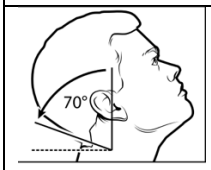
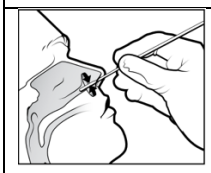
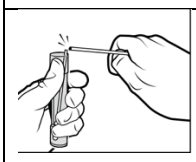
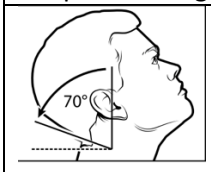
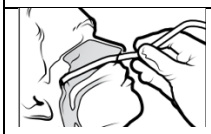
- Apart from the normal equipment you need a chair with a back for the adult assistant
- If you are going to do a NPA you also need a nasogastric tube and a syringe
- Ask the adult with the child to wipe excessive nasal secretions away with a tissue and have them discard the tissue into contaminated waste bin.
- The adult accompanying the child should sit on the chair facing the examiner leaning back into the back of the chair
- A small child should sit on the adult's lap, older children can stand between the legs of the adult.
- The legs of the child are held in-between the thighs of the seated adult.
- One hand of the assistant holds the child's hands across his chest while the other hand stabilises the child's head against their chest (as for throat examination of the uncooperative child)
- Refer to next page or watch https://www.youtube.com/watch?v=lTyBvZhLL04 for a video demonstrating how MTNS samples should be collected.

Sample transportation to the virology laboratory

- Once the sample has been collected, it must be "double-bagged", preferably using a biohazard bag, to enable easy identification by laboratory staff and to help prevent an inadvertent laboratory exposure

Forms to be completed by the clinician collecting the sample

- This may vary between institutions therefore check with the local testing centre and laboratory
- NHLS Clinical Pathology request form to accompany specimen to laboratory (refer to picture of sample completed form)
- NICD PUI form for coronavirus disease 2019 (COVID-19) and contact line list (may be kept in patient's folder for actioning if test result is positive)
- Results of tests are made available on TrakCare and positive results will be communicated from the laboratory to the Department of Health

Mid-turbinate nasal swab	
	Hold head against the chest of the assistant and have the assistant lean into the chair back. Tilt the head back to approximately 70 degrees The assistant should keep the head in place
	While rotating gently insert the swab until you meet resistance Note the direction of insertion in this picture – the swab should be inserted in the direction of the tragus of the ear on the same side and NOT towards the upper teeth Older children can be asked to breathe through their mouth
	Rotate the swab against the nasal wall The same swab may be used to swab the other nostril
	Break the swab off in the viral transport medium OR if not available in a **sterile DRY container** (e.g. a CSF tube)
Nasopharyngeal aspirate 5 or 8F catheter and 5 cc syringe attached Measure the distance from the nostril to the opening of the ear – with the catheter. This is how deep it should go	
	Hold head against the chest of the assistant and have the assistant lean into the chair back. Tilt the head back to approximately 70 degrees The assistant should keep the head in place
	Gently insert the catheter until you meet resistance Note the direction of insertion in this picture –inserted in the direction of the tragus of the ear on the same side and NOT towards the upper teeth Older children can be asked to breathe through their mouth
	While rotating and suctioning remove the catheter If no aspirate, repeat in the other nostril using the same catheter
	Draw up a small amount of transport medium or saline via the catheter and eject it into the tube

NATIONAL HEALTH LABORATORY SERVICE

CLINICAL PATHOLOGY

SAMPLE SAMPLE FOR LAB LABELS

PLEASE PRINT IN BLOCKS AND (X) THE APPLICABLE BOXES

MARK IF URGENT ☒ 1. ~~THEATRE~~ **Patient I.D. Number**
2. INPATIENT

LOCATION

HOSPITAL / CLINIC
Ward
Cost Centre

PATIENT INFORMATION

Patient Hosp./ Clinic Number
Fee class
Surname PATIENT
First name STICKER
Address PATIENT LABEL
Postal Code
Tel/Cell
Sex M F
D.O.B. D D M M Y Y Y Y
Age

CLINICAL / SPECIMEN DETAILS

Diagnosis / reason for request SUSPECTED COVID19
CLINICAL PRESENTATION + SEVERITY
Medication Warf Hep
Type of specimen MID TURBINATE NASAL SWAB
Taken on DATE at TIME
Taken by DOCTOR

PRIVATE PATIENTS ONLY

ICD10 diagnosis codes:
Medical Aid: Plan:
Medical Aid No: Employer:
Authorisation No: Dep code:
Account to / Principal Member:
Member address:
Postal Code
Member Tel. No. (H/Cell): (W):
Member I.D. number:

CONTACT DETAILS OF RESPONSIBLE PRACTITIONER

NAME (Prof (Dr) / Sr) STAMP
Persal or Practice No MP NUMBER
Cell No Bleep
Tel(0) Fax (0)
Signature #

CHEMICAL PATHOLOGY

General:		Rands
HS*	Blood gases	45
Y	Sodium	25
Y	Potassium	25
Y	Chloride	15
Y	Urea	25
Y	Creatinine	25
Y	Calcium	25
Y	Magnesium	25
Y	Inorganic phosph	25
Y	Uric acid	27
Y	Total protein	25
Y	Albumin	34
Y	Total bilirubin	29
Y	Conj. bilirubin	22
Y	ALP	35
Y	GGT	38
Y	ALT	38
Y	AST	38
Y	LDH	38
Y	Amylase	36
Y	Lipase	36
Cardiac:		
Y	CK	40
Y	CK-MB	38
◔	Troponin	141
Diabetes / metabolic:		
Grey	Glucose - fast	25
Grey	Glucose - rand	25
P	HbA1c	71
Grey*	Lactate	173
Lipids:		
Y	Triglycerride	56
Y	Total cholesterol	38
Y	HDL-cholesterol	49
Anaemia:		
Y	HDL-cholesterol	59
Y	Transferrin	83
Y	Ferritin	93
Y	Vitamin B12	93
P*	Folate - red cell	131

Endocrinology:		Rands
Y	TSH	146
Y	Free T4	123
Y	Free T3	123
Y	bHCG	87
Y	FSH	93
Y	LH	93
Y	Estradiol	93
Y	Progesterone	96
Y	Prolactin	93
Y	Testosterone	93
Y	SHBG	93
◔	PTH	127
Y	Cortisol	93
Y	Insulin	93
Y	AFP	93
Cerebrospinal fluid:		
Grey	CSF glucose	25
	CSF chloride	18
	CSF protein	22

DRUGS

Y	Paracetamol	80
Y	Salicylate	80
Y	Lithium	39
Y	Methotrexate	80
Y	Tricyclics	80
Y	Phenytoin	80
Y	Phenobarbitone	80
Y	Epilim / Na valpr	80
Y	Carbamezepine	80
Y	Digoxin	92
Y	Theophylline	80
	Urine mandrax	80
	trough peak	
P	Cyclosporin	154
Y	Amikacin	88
Y	Gentamycin	88
Y	Vancomycin	88

Time of dose :

HAEMATOLOGY

General:		Rands
P	FBC	48
P	Differential count	26
P	Film (morph)	26
P	Haemoglobin	15
P	White cell count	15
P	Platelet count	18
P	Reticulocytes	24
P	Malaria screen	43
◔	ESR	24
Coagulation:		
B	INR	39
B	PTT	44
B	Fibrinogen	28
B	D-dimers	216
B	Thrombin time	56
B	Antithrombin III	173
B	Lupus anticoag	197
B	Protein C	238
B	Protein S	293
B	APC Resist	205
Other:		
P	Coombs	29
©	CSF/Fld cytosp	52

VIROLOGY

HIV testing:		Rands
Y	HIV serology	97
PP	HIV viral load	318
P	PCR : HIV	387
Hepatitis serology:		
Y	Clinical hepatitis:	105 ea
	A B C	
Y	Hepatitis immunity:	
	A B	

Other serology:	IgM 102	IgG 94
Y CMV		
Y EBV		
Y HSV		
Y VZV		
Y Rubella		
♦ Measles		
Y Mumps		

Viral isolation:

P	CMV pp65 Ag	323
	Rapid RSV	87 ea
	Rap. rota/adeno	169
	Culture (specify)	87
	PCR (specify)	var

IMMUNOLOGY

P	CD4 (PLG)	64
Y	CRP	60
Y	IgG, IgA, IgM	55 ea
Y	Total compl	97
Y	Syphilis Serology	16
Y	ASOT / DNase B	87
Y	Toxoplasma	94
Y	ANF	116
Y	Anti ds-DNA	116
Y	Anti cardiolipin	93
Y	ANCA	232
Y	RF	61
Y	ENA	115 ea

MICROBIOLOGY

Specimen site:

General:		
Y	Routine MC&S	≥81
Y	CSF cell count, microscopy & culture	≥141
Y	Fungal M&C	≥67
Y	Blood culture	≥101
Y	Parasites	≥57
TB investigation:		
	Microscopy	32
	Culture	≥101
	Sensitivity	≥190
Antigen detection:		
	Cryptococcal Ag	40
	Pneumocystis	87
	Chlamydia	116
	C. difficile toxin	217

OTHER TESTS (ALL DISCIPLINES)

For full repertoire of tests, consult laboratory handbook

COVID19 PCR

RISK FACTORS:
1. CONTACT WITH COVID19
2. RELEVANT TRAVEL HISTORY
3. ADMISSION TO COVID19 FACILITY

RECEIVED IN LAB

* MUST BE FILLED IN.
#IF URGENT INDICATE
1. ~~THEATRE~~
2. INPATIENT ADMISSION

 # PROVINCIAL REQUIREMENTS : Specimens may be rejected if Patient name and number, Practitioner name, signature and Persal / Practice number, or Hospital / clinic / ward are omitted.

Signature & PERSAL No. of Consultant: I hereby certify that I have considered the repertoire of tests requested as well as previous

SORT	LABEL

APPENDIX 2: PERSONAL PROTECTIVE EQUIPMENT (PPE)

TYPE OF PPE	CLINICAL STAFF (nurses, doctors, EMS) Providing direct care to COVID-19 patients or patients with respiratory symptoms	NON-CLINICAL STAFF (admin staff, catering staff) Coming into distant contact with COVID-19 patients and contaminated surfaces	NON-CLINICAL STAFF (cleaners) Coming into distant contact with COVID-19 patients and contaminated surfaces	PATIENTS with or without RESPIRATORY symptoms
Gloves	Non-sterile gloves. Change between patients	Non-sterile gloves. Change when leaving COVID-19 area	Reusable long rubber utility cleaning gloves (ideally up to elbow) Change after completed cleaning contaminated area	None
Face cover type	**Surgical Mask** for general care of COVID-19 patients **N95 respirator** for aerosol generating procedures* on COVID-19 suspects/cases**	**Surgical mask** when within <1m of a patient with respiratory symptoms (one per shift, if integrity maintained)	**Surgical mask** when within <1m of a patient with respiratory symptoms	**Surgical mask** worn when in contact with others
Aprons or gowns	Change between patients	Change when leaving COVID-19 area	After each work session (in absence of clinical contact)	None
Face shields, or visors, or	Wash clean, disinfect and reuse	None	Wash clean, disinfect and reuse	None

goggles, or other eye covers				

* Aerosol-generating procedures in children include: collection of nasopharyngeal and oropharyngeal swabs for SARS-CoV-2 testing, clinical examination of the pharynx, nebulization, nasal/oral/tracheostomy suctioning, insertion of a nasogastric tube, blood-taking & intravenous cannula placement in young children, chest physiotherapy, non-invasive CPAP or HFNC ventilation, manual bag-mask ventilation, endotracheal intubation, tracheal aspirate, bronchoalveolar lavage, bronchoscopy, endoscopy, ENT procedures, dental procedures, maxillo-facial procedures and cardiopulmonary resuscitation.

** N95 respirator must still be used for all other non-COVID-19 indications (e.g. when attending to a patient with confirmed or suspected TB)

GUIDELINES FOR USE OF A N95 RESPIRATOR FOR COVID-19

FOR AER0SOL GENERATING-PROCEDURES ONLY

- Seal tests should be performed each time a N95 respirator is used (i.e. when it is first put on)

How to wear a N-95 respirator:

Perform the seal test with every use to ensure the respirator fits properly around the face and nose

Negative seal check
Cone-shape: cup hands over respirator lightly. Breathe in sharply. No air should leak in around the face. to- Duck-bill + V-flex: Breathe in sharply. The respirator should collapse inwards

Positive seal check
Cone-shape: Cup hands over respirator. Blow out. A build-up of air should be felt with no air leaks.
Duck-bill + V-flex: Breathe out forcefully; the respirator should expand on the exhale.

- The N95 respirators should ideally be used once only and should be discarded once safely removed. However, as there is a global shortage of N95 respirators, reuse is strongly encouraged and is preferable to having no respirator.
- If HCWs are performing aerosol-generating procedures (e.g. sample collection) on several COVID-19 patients sequentially, they may use the same N95 respirator and eye protection for the session; **they must however change apron and gloves between patients.**
- As the outside surface of the N95 respirator will become heavily contaminated with the virus during aerosol-producing procedures, HCWs should take great care not to touch the outside surface and must perform careful hand hygiene after removing it.
- For reuse, carefully remove the N95 respirator using a clean paper towel and store the respirator in a clean paper bag. The paper bag must be labelled with the staff member's name. Do not crush or crumple. It can be reused for up to 1 week.
- Do NOT attempt to disinfect the N95 respirator as that destroys its integrity.
- Note that obviously damaged and visibly contaminated respirators cannot be reused.

GUIDELINES FOR SURGICAL MASK USE FOR COVID-19

- At any time if surgical masks are touched by unwashed hands, get wet, are soiled, or are removed from the face, they will become contaminated and will no longer provide effective protection. They should then be discarded.
- Masks that are not wet, were not touched by unwashed hands and were not removed from the face, can be worn for up to 8 hours.
- COVID-19 patients when inside a dedicated COVID-19 ward, where staff are wearing PPE, do not need to wear masks.
- COVID-19 patients when outside a dedicated COVID-19 ward must always wear a surgical mask. The mask can be used for up to 8 hours.

FOR HOW LONG CAN PPE BE USED?

TYPE OF PPE	CLINICAL HCW	NON-CLINICAL HCW	SYMPTOMATIC PATIENTS
Gloves	Change after each clinical contact	End of work session	N/A
Surgical Face Masks	Mask can be used up to the end of a shift if it remains dry and has not been removed from the face.	Mask can be used up to the end of a shift if it remains dry and has not been removed from the face.	When in contact with others

N95 respirator	As long as integrity is maintained and it is safely stored, it can be reused for up to 1 week.	N/A	N/A
Aprons	Change after each clinical contact	After each work session (in absence of clinical contact)	N/A
Face shields/ visors	Clean and disinfect before reuse	N/A	N/A
Goggles	Clean and disinfect before reuse	Cleaners may use same googles for each work session. Clean and disinfect before reuse	N/A

VIDEO DEMONSTRATION OF DONNING AND DOFFING OF PPE

A demonstration video for safely putting on and taking off PPE (donning and doffing of PPE) is available at:

https://player.vimeo.com/external/400607941.hd.mp4?s=af075e8c9647a23114424834c1e73f866a73e5f7&profile_id=174

INSTRUCTIONS FOR PUTTING ON AND TAKING OFF PPE (DONNING AND DOFFING PPE)

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (DONNING)

Wash your hands before putting on the PPE. PPE should be put on in an order that minimises contamination. The apron, mask, goggles and gloves must be put on in that order. See guidance on each below.

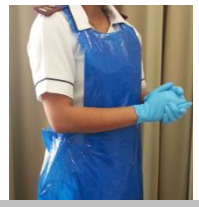
Apron

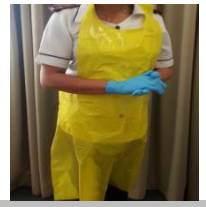
SEQUENCE FOR TAKING OFF PERSONAL PROTECTIVE EQUIPMENT (DOFFING)

Wash your hands before taking off the PPE. PPE should be removed in an order that minimises contamination. The gloves, apron, goggles/visor, and mask must be removed in that order.* **Wash your hands after taking off the PPE.** Discard PPE in infectious waste container. See guidance below.

Gloves

- ***Wash hands***
- Slip it over the head and tie the stings behind the back





Mask or N95 Respirator

- Secure each tie or elastic at the middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator by blowing into it (air should not leak out)

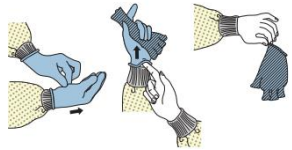
Goggles or Visor

- Place over face and eyes
- Adjust band to fit comfortably

Gloves

- Hold the edge of the glove as you pull it over your hand
- Extend to cover wrist
- Once gloved, do not touch other surfaces

- ***Wash hands***
- Securely grasp the outside of glove with the gloved hand; peel off; discard as infectious
- Slide the fingers of the un-gloved hand under the remaining glove at the wrist; peel off; discard as waste



opposite

waste

infectious

Apron or Gown* (See Note)

- ***Wash hands***
- Unfasten or break apron/gown ties
- Pull the apron away from the neck and shoulders, touching the inside of the apron bring it forward and over the head
- Turn the apron inside out, fold or roll into a and discard as infectious waste

only and

bundle

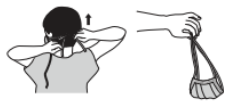
Goggles or Visor* (See Note)

- Remove goggles/visor from the back by head band or ear pieces
- Place in designated receptacle for disinfecting

lifting

Mask or N95 Respirator

- Untie or break bottom ties, followed by or elastic.
- Remove by handling the ties only and as infectious waste.
- ***Wash hands***



top ties

discard

***Note.** When it is practically difficult to remove the apron/gown before the visor/goggles, then the visor/goggles may be removed before the apron/gown.

Dispose of all PPE in an infectious waste container.

WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITISER AFTER REMOVING GLOVES AND AFTER REMOVING ALL PPE

6. How to transition between home and work

- Follow these principles to protect yourself at work and to protect your family by not bringing COVID-19 home.

What must I do before leaving home and arriving at work?

Clothes

- Wear dedicated simple clothing (like short-sleeved t-shirt and pants) and cheap/old, dedicated work shoes. If long sleeves, keep them rolled up.
- Hot wash and dry clothes daily (or alternate 2 sets if unable to dry daily).
- Avoid wearing a belt, jewellery and a lanyard.
- Avoid a cloth surgical cap, use a disposable cap instead.

Phone, wallet and keys

- Leave wallet at home – bring essentials (like access card, drivers licence, bank card) in sealable plastic (Ziploc) bag.
- Remove protective case from phone. Consider keeping phone in closed, sealable plastic (Ziploc) bag and change this daily.
- Keep your phone in your pocket/bag, avoid placing it on work surfaces. Leave it on loud volume.
- If able, wipe phone down between each patient.
- Keep your keys in your pocket/bag and do not remove until after you have washed hands when leaving work.

Food and drink

- Bring lunch from home in reusable fabric shopping bag, avoid bought lunches from canteen/tearoom.
- Use own water bottle, avoid water coolers, kitchens and bought drinks.

What can I do to protect my family when leaving work and arriving home?

- Leave pen at work. Frequently coat it with alcohol hand rub throughout the day.

When leaving work:

- Remove work clothes and place in plastic bag to take home.
- Perform thorough hand and arm wash.

- Keep alcohol hand rub in car/bag and use to clean hands.

When you arrive home:

- Remove shoes and leave outside before entering home.

- If not already changed, remove work clothes at front door. Put these (or clothes in bag if changed already) straight into a hot wash, along with reusable fabric shopping bag. Then thoroughly wash hands.

- Immediately have hot shower/ bath/wash.
- Avoid hugs, kisses and direct contact with family members until after shower/bath/wash.

APPENDIX 3: OVERALL MANAGEMENT PROCESS AT PRIMARY CARE LEVEL

SCREEN

1. Every child entering a health facility
2. Ask about symptoms

YES

RISK:
to COVID stream

Acute respiratory illness with sudden onset of fever ≥38°C or history of fever **AND** at least one of the following:

- cough,
- sore throat or
- shortness of breath

NO

NO RISK:
to NON COVID stream

Implement protective measures

- Hand hygiene
- Social distancing
- Environmental cleaning

ASSESS DISEASE SEVERITY USING IMCI

Assess the following: - **Danger signs (see box below)** - **Respiratory rate** - **Stridor** - **Chest-indrawing** - **Wheeze** - **Pulse oximetry (if available)**	**Classify Cough or Difficulty breathing**	ANY General DANGER SIGN OR Chest indrawing OR Stridor in calm child OR Oxygen sats <92% in RA	**SEVERE PNEUMONIA OR VERY SEVERE DISEASE** ***POSSIBILITY OF COVID-19 High***	Manage as per pg 26 of IMCI chart book Give Oxygen, First dose of Ceftriaxone, check Glucose, Keep warm If wheezing give Salbutamol via MDI + spacer and repeat after 15 mins# If Stridor, give ADRENALINE NEBS **REFER TO HOSPITAL** **SARS-CoV-2 PCR to be done at Hospital**
		Fast Breathing	**PNEUMONIA** ***POSSIBILITY OF COVID-19***	Manage as per pg 26 of IMCI chartbook Treat with Amoxil Advise caregiver when to return immediately Follow up in 2 days ***Do mid-turbinate nasal swab for SARS-CoV-2 PCR** **Home isolation for 14 days**
		NO signs of pneumonia or severe disease	**COUGH OR COLD** ***POSSIBILITY OF COVID-19***	Manage as per pg 26 of IMCI chartbook. ***Do mid-turbinate nasal swab for SARS-CoV-2 PCR** **Home isolation for 14 days**
	Classify wheeze	Any history of wheeze, cough at night, Wheeze for 7 days, on treatment for Asthma	**RECURRENT WHEEZE** ***POSSIBILITY OF COVID-19***	Manage as per pg 26 of IMCI Use MDI + spacer instead of nebuliser# ***Do mid-turbinate nasal swab for SARS-CoV-2 PCR** **Home isolation for 14 days**
		Any other wheeze	**FIRST EPISODE WHEEZE** ***POSSIBILITY OF COVID-19***	Manage as per pg 26 of IMCI chartbook ***Do mid-turbinate nasal swab for SARS-CoV-2 PCR** **Home isolation for 14 days**

see table below re nebulisation
* see section below on how to perform a mid-turbinate nasal swab

GENERAL DANGER SIGNS:

- **Inability to drink or Breastfeed**
- **Vomiting everything**
- **Lethargic or unconscious**
- **History of convulsions during this illness or currently convulsing**

FAST BREATHING	**If the child is < 2months**	**= >60**
	If child 2mo – 12mo	**= >50**
	If child older than 12mo- 5yr	**= >40**
	If child older than 5 yr	**= >30**

AVOID the following in children with COVID-19 or suspected COVID-19

5. Routine examination of the mouth and throat:
If sore throat, treat with oral Penicillin or Amoxicillin
(see page 30 of the IMCI chart book)
Follow up in 5 days if symptoms worse or not resolving- then refer to hospital.

6. Nebuliser:
For ***wheeze***, give Salbutamol via MDI and spacer 4-8 puffs. Allow 4-5 breaths per puff. Use a facemask onto the spacer for those children younger than 4 years
If still wheezing repeat every 15 mins in the first hour.
If no improvement, discuss with Dr. and reclassify as severe disease
If improvement continue 2- 4 hourly.
*For **stridor,** continue with nebulised adrenaline*

7. NSAID's and oral steroids
Give paracetamol 15mg/kg for fever and pain
Oral steroids are still indicated in those with known Asthma

8. Nasal or oral suctioning, Bag mask ventilation and CPAP
Use full PPE for resuscitation

APPENDIX 4: OVERALL MANAGEMENT PROCESS AT HOSPITAL LEVEL

Management of Children with Suspected / Confirmed COVID-19

Criteria for person under investigation PUI), i.e. a person to be tested for SARS-CoV-2 (adapted from NICD, 9 April 2020):
Acute respiratory infection with sudden onset or history of fever (>38°C) **AND** at least one of the following:
- Cough
- Sore throat
- Shortness of breath

Children at highest risk (MUST be tested):
Acute respiratory illness **AND** who in the 14 days prior to onset of symptoms:
- Had close or household contact with a confirmed COVID-19 case **OR**
- Had close or household contact with a health care worker who works in a facility where COVID-19 patients are being treated **OR**
- Anyone in the household with a flu-like illness or pneumonia

Test and Assess
- Apply surgical masks to child (if >2 yrs) & caregiver and isolate
- Perform COVID-19 test
- Assess severity of disease
- Consider alternative diagnoses including HIV testing, TB screening, nutritional assessment, immunisation
- COVID-19 test result:
  - if positive, notify
  - If negative & at home, de-isolate & monitor for 14 days
  - If negative & admitted, keep isolated

Mild disease
- Treat at home
- Admit to hospital or isolation facility if self-isolation at home is not feasible

Home treatment
- Paracetamol
- Nutritional support
- Alert to danger signs
- Home isolation

De-isolation
- 14 days from onset of symptoms

Moderate disease
- Admit to hospital
- Cohort with respiratory / COVID-19 cases

Hospital treatment
- Oxygen
- Paracetamol
- 3 – 4 hourly review
- Nutritional support
- Empiric antibiotics

De-isolation
- 14 days after stable –no longer need oxygen
- Continue treatment at home

Severe disease
- Admit to hospital
- Discuss with nearest high-care unit (HCU) / paediatric intensive care unit (PICU)

HCU / PICU admission
- General respiratory supportive measures (e.g. oxygen, stop feeds, consider proning)
- Manage as for severe pneumonia according to local unit protocols

De-isolation
- 14 days after stable –no longer need oxygen
- Continue treatment at home

Assessment of severity

	Mild	Moderate	Severe
Mental status	Normal	Restless	Irritable/lethargic
Feeding	Finishes feed	Does not finish feed	Unable to feed
Talking	Full sentence	Interrupted sentence	Unable to talk
Respiratory rate (breaths/min.)	<40 if under 1yr <30 if 1 – 5 years <20 if over 5 years	40-60 if under 2 months 40-50 if 2 – 12 months 30-40 if 1 – 5 year 20-30 if over 5 years	>60 if under 2 months >50 if 2 – 12 months >40 if 1 – 5 year >30 if over 5 years
Respiratory signs	No distress	Lower chest wall indrawing	Grunting and/or severe lower chest wall indrawing
Pulse oximetry (SpO_2)	≥92% in room air	<92% in room air	<92% in room air Central cyanosis

Whenever possible, avoid the following in children with COVID-19

- Routine oropharyngeal examination unless wearing full personal protective equipment (PPE, including N95 respirator and eye protection)
- Nebulisers – rather use a metered-dose inhaler (MDI) with spacer
- Non-steroidal anti-inflammatory drugs (NSAIDs) & oral steroids
- High-flow nasal cannula (HFNC) oxygen therapy
- Minimise nasal or oral suctioning and bag-mask ventilation

- If required, non-invasive continuous positive airway pressure (CPAP) or bilevel positive airway pressure (BiPAP) should preferably be delivered in a negative pressure PICU or high-care isolation cubicle by staff with full PPE (including N95 respirator and eye protection)

APPENDIX 5: INTUBATION OF A SUSPECTED/CONFIRMED COVID-19 PATIENT

Plan and Prepare

- Your personal protection is the priority.
- Identify isolation precautions AND PPE (N95 mask, surgical gown, gloves, cap and eye protection, visors if available)
- Pay close attention to avoid self-contamination
- Go through Intubation checklist / identify senior personnel / allocate roles
- Communicate well to the team inside the room and the team outside. Limit personnel in room
- Extra items to remember:
    - Filters
    - Cuffed ETT
    - plastic to cover patient
    - CMAC where available
    - in-line suctioning
- All extra ETT/suction catheters that is not opened/used should be kept in a clear plastic bag on the trolley to avoid contamination

Allocation of roles:

- Doctor A: Most experienced person to perform intubation
- Doctor B: Help with bagging, connection to ventilator, confirm ETT position and inflate ETT cuff
- Nurse A: Gives induction drugs and help with monitoring
- Nurse B: Should be outside the isolation room in PPE with red resuscitation trolley to pass any other equipment if needed. (This is to avoid contamination of red trolley)

Intubation:

- Must have NGT in place, to empty stomach
- Most experienced person available to perform intubation
- Most children can be intubated with Ketamine and Rocuronium.
- Preoxygenate with 100% O2 to avoid manual ventilation – this can be done on CPAP/NPO2 whatever was used prior to intubation
- Cuffed ETT with in-line suction connected and manometer to inflate cuff
- Use CMAC/video laryngoscopy if available
- Plan for RSI with skilled assistant
- Consider using a two-person bag-mask technique to get a good seal
- Use plastic bag to intubate under to limit droplet spread
- Intubate and connect ventilator and in-line suctioning immediately.
- Avoid bagging patient.
- Confirm ETT position: use EtCO2 and check chest rise - don't use your own stethoscope. Only the one available at the bedside

- Try not to disconnect the ventilator if the patient desaturates.
- Higher ventilator pressure may be needed initially/temporarily to recruit the lung and maintain saturations.

- *If Intubation attempt unsuccessful or patient desaturates during the intubation attempt*: Start Bag-mask ventilation using small tidal volumes. Ensure filter between face mask and bag, if you use a T-piece – a filter is crucial
- Attempt intubation again once patient adequately oxygenated.

Post intubation:

- After leaving isolation area – to wipe down the surfaces and non-disposable items
- Correct Doffing procedure
- Disposable equipment should be placed in disposable plastic bag at end of procedure and disposed in the red bins inside the isolation room.

APPENDIX 6: GUIDELINES FOR MOTHERS/CAREGIVERS OF CHILDREN WITH SUSPECTED COVID-19

Self-isolation

- You should quarantine yourself with the child at home. Don't go to work, avoid unnecessary travel, and as far as possible avoid close interactions with other people.
- You should clean your hands and the child's hands with soap and water frequently.
- Do not have visitors in your home, including family who do not live with you, or have other children to play. Only those who live in your home should be allowed to stay.
- You and the child should wear facemasks when in the same room as other people in the house (or if you must go out especially in a vehicle).
- At home, you should stay in a specific room with the child with the door closed and window open, only coming out when necessary, wearing a facemask. You and the child should use your own bathroom (if possible), or the bathroom should be fully cleaned before others use it and the windows opened. Disposable nappies must be put in a plastic bag and carefully sealed before throwing them away.
- You should practice good cough and sneeze hygiene and teach the child or help the child to do the same, by coughing or sneezing into a tissue, discarding the tissue immediately afterwards in a lined trash can, and then wash hands immediately. If you do not have tissues, you should cough or sneeze into your elbow
- You should avoid sharing household items like dishes, cups, eating utensils and towels. After using any of these, the items should be thoroughly washed with soap and water.
- All surfaces like table-tops, counters, toilets, that you may have touched or that you touch frequently should be appropriately and frequently cleaned, with soapy water or disinfectant. This includes carefully cleaning phones, computers, etc. if others will touch them.
- All used and dirty laundry (sheets, clothes) must be washed at the highest temperature possible using laundry detergent. (This should be above 60° C, If possible). Clean all surfaces and the area around the washing machine. Wash your hands thoroughly with soap and water after handling dirty laundry.
- Dry clothes in the sun (or tumble dry) and iron everything well using the highest setting you can.
- Monitor your symptoms and those of the child - Seek prompt medical attention if your illness is worsening, for example, if you have difficulty breathing, or if the person you are caring for symptoms are worsening. If it's not an emergency, call your doctor or healthcare facility at the number below. If it is an emergency and you need to call an ambulance, inform the call handler or operator that you are being tested for SARS-CoV-2.

Breastfeeding: women who are breastfeeding should continue to do so regardless of COVID 19 status

- Wear a mask during breastfeeding. Where medical masks are not available, wear a home-made mask. Wash the mask in soapy water after every feed and dry in sunshine
- Wash hands with soap and water before feeding
- Keep breasts and nipples clean by washing with soap and water
- Disinfect all surfaces they have touched with 4 teaspoons of bleach in 1 litre of water

Child-care in general:

- **Do:**
  - Wash children's hands frequently with soap and water
  - Eye contact and smiling and games from a safe distance of 1.5 meters will help to keep contact with children

        - Wear a face mask when in contact with a child (i.e. less than 1.5m) especially if you have a cough, and if you are together in a small closed room
        - Keep windows or doors open as much as possible to keep the air clean and fresh
    - **Don't:**
        - Don't use hand sanitizer on babies and children's hands
        - Don't kiss babies and children
        - Don't touch the child's eyes, put fingers into child's mouth or blow in child's face

Feeding guidelines

- continue usual feeding practices, encourage child to eat in spite of anorexia
- ensure food utensils are clean and not shared

Watch for Symptoms: explain to parents/caregivers about the symptoms

- Symptoms of COVID-19 similar in children and adults - Cold- like symptoms such as fever, runny nose and cough. Sometimes vomiting and diarrhoea
- Check for danger signs such as fast breathing, not eating, vomiting everything, fever, shaking/fits, swollen ankles
- Extra care must be taken with children who have chronic health conditions and low immunity

What to do when your child has symptoms: advise parents/caregivers to contact or attend their health facility or doctor or helpline for advice and inform them they have been in contact with someone with COVID-19.

APPENDIX 7: SIMPLE TERMINOLOGY / CONCEPTS

There are a variety of terms or concepts that patients and their family need to understand in dealing with COVID-19.

CLOSE CONTACT

Contact with a person with confirmed or suspected COVID-19 in the following context:

- Face-to-face contact (within 1 metre) or in a closed environment for more than 15 minutes;
- Living in the same household;
- Working closely together;
- Any healthcare worker not wearing PPE.

HAND HYGIENE

This is a preventive and protective measure. There are 2 modalities of hand hygiene:

- Hand washing:
    - Washing with soap and running water;
    - For 20 seconds;
    - Both surfaces of hands and forearms and between all fingers;
    - At least twice daily; when soiled; before preparing food; before eating; after using the toilet.
    - Fingernails should be kept short
- Sanitising with alcohol-based hand rub (at least 60% alcohol):
    - When unable to wash with soap and water;
    - After contact with frequently touched surfaces.

SOCIAL DISTANCING (PHYSICAL DISTANCING)

This is a preventive and protective measure.

- Staying at home as much as possible;
- Staying at least 1 – 2 metres from other people;
- NOT hugging, kissing or shaking hands;
- Avoiding groups
- Avoiding contact with frequently touched surfaces such as door-knobs.

SELF-QUARANTINE

Applies to a person who has had close contact with another person with suspected or confirmed COVID-19.

This entails the following:

- Staying at home for 14 days
- Minimising contact with other household members
- Not sharing household items

SELF-MONITOR

Applies to a person who has had close contact with another person with suspected or confirmed COVID-19 and is in self-quarantine. It involves looking out for early signs of COVID-19:

- Check temperature twice a day or monitor for feeling feverish
- Watch for symptoms:
    - Respiratory illness – cough, shortness of breath;
    - General ill health – excessive tiredness, muscle aches and pains.

SELF-ISOLATION

This applies to an individual with confirmed COVID-19 and entails the following:

- Staying at home for 14 days;
- As far as possible, using separate bedroom and bathroom;
- Minimising contact with other household members;
- Not sharing any household items.