

NEWBORN CARE CHARTS

ROUTINE CARE AT BIRTH AND MANAGEMENT OF THE SICK AND SMALL NEWBORN IN HOSPITAL

AUGUST 2021



**GUIDELINES FOR THE CARE OF ALL
NEWBORNS IN DISTRICT HOSPITALS,
HEALTH CENTRES AND MIDWIFE
OBSTETRIC UNITS IN SOUTH AFRICA**



FOREWORD

Ensuring that newborns survive and thrive is a global priority, which requires impeccable skills and the utmost passion and dedication from the health care professionals entrusted to care for them. As Limpopo province, we strive to provide excellent quality of health care to all citizens including our newborns. It is for this reason that we invest in developing compassionate and skilled health care professionals at all levels of our health care system.

The Limpopo Initiative for Newborn Care (LINC) is an evidence-based training, support and mentoring package for health care workers at district and regional hospitals. The Management of the Sick and Small Newborn in South Africa (MSSN) are guidelines that were specifically developed for the Limpopo setting, and to be used in any other predominantly rural setting in South Africa and the SADC region. This version of the guidelines has been updated to reflect the ever changing landscape of the health system and priority programmes that have a direct impact on the quality of care that we provide to our newborns in the province. As a province, we pride ourselves with our Tertiary Hospital Complex Newborn Champions/Specialists who played a pivotal leadership role in the process of updating the guidelines to ensure that they continue speaking to the frontline health care workers, who are essentially the primary beneficiaries of these guidelines.

It is with great pleasure to present the updated MSSN guidelines for Limpopo, which will continue providing our frontline health care professionals with the necessary resources to enhance their skills towards providing optimal quality care to every newborn, espoused by our vision and values as a department. Every newborn counts, a legacy which we bequeath all newborns in our province.



Dr. FT Mhlongo
Head of Department
Limpopo Department of Health

TABLE OF CONTENTS

ROUTINE CARE AT BIRTH	3
A. Helping babies breathe.....	4
B. Rapidly assess baby immediately after birth.....	5
C. Fully assess baby after birth in postnatal area / ward.....	6
D. Assess and manage risk factors or special treatment needs.....	7
E. Provide routine treatment to the well-baby.....	8
F. Counsel the mother: Counselling skills.....	9
G. Counsel on breastfeeding, expressing breast milk and cup feeding.....	10
H. Assess and classify for breast problems in the mother.....	13
I. Counsel the mother who is not breastfeeding.....	14
J. Daily review and discharge.....	15

MANAGEMENT OF SICK AND SMALL NEWBORNS IN DISTRICT HOSPITALS	16
ASSESS AND CLASSIFY.....	17
1.1. Assess need for emergency care.....	18
1.2. Assess priority signs.....	19
1.3. Assess for injuries, abnormalities or local infection.....	21
1.4. Assess risk factors and special treatment needs.....	23

PRINCIPLES OF NEWBORN CARE AND TREATMENT	24
2.1. Maintain normal body temperature.....	25
2.2. Safe oxygen therapy.....	28
2.3. Maintain normal glucose.....	33
2.4. Feeds and fluids for sick and small babies.....	34
2.5. Infection prevention and control.....	36

SPECIFIC NEWBORN PROBLEMS	38
3.1. Apnoea.....	39
3.2. Respiratory distress.....	39
3.3. Preterm and low birth weight.....	41
3.4. Serious acute infection.....	49
3.5. Neonatal encephalopathy.....	50
3.6. Neonatal seizures.....	52
3.7. Neonatal jaundice.....	53

3.8. Congenital abnormalities.....	55
3.9. Syphilis.....	57
3.10. Tuberculosis.....	58
3.11. HIV affected mothers and babies.....	59
3.12. Care of HIV infected babies.....	61

DISCHARGE AND FOLLOW-UP	62
4.1. Transfer and referral.....	63
4.2. Discharge.....	64
4.3. Neonatal follow up.....	65
4.4. Development chart (0-18 months).....	66

CHARTS, RECORDING FORMS AND REFERENCES	67
5.1. Drug dosages.....	68
5.2. Recording form: Routine Care.....	73
5.3. Growth chart.....	76
5.4. Recording form: Initial assessment: Sick and small newborns in hospital.....	77
5.5. List of abbreviations.....	79
5.6. References and contributors.....	80

Note: This document allows you to click on a page reference to jump to that page. If you are using an android or Apple device you might want to download the Adobe Reader App for better functionality. Click below to download:
<http://www.adobe.com/africa/products/reader-mobile.html>

MANAGEMENT OF NEWBORNS: ROUTINE CARE AT BIRTH



MANAGEMENT OF SICK AND SMALL NEWBORNS

Assess need for emergency care **if present** EMERGENCY TREATMENT until stable



Assess need for emergency care



Assess for respiratory distress



Assess for priority signs



Assess for injuries, abnormalities or local infections

Principles of newborn care

- Maintain normal body temperature
- Administer oxygen if needed
- Maintain normal glucose
- Manage feeds and fluids
- Infection prevention and control
- Transfer and referral

Treat specific conditions

- Apnoea and respiratory distress
- Preterm and low birth weight
- Assess feeding and weight gain in low birth weight babies
- Serious acute infection
- Neonatal encephalopathy
- Neonatal seizures
- Neonatal jaundice
- Congenital abnormalities
- Congenital Syphilis
- Congenital Tuberculosis
- HIV-affected mothers and babies
- Care of HIV infected babies



Counsel

- Baby's illness
- Feeding
- When to return



Discharge

- **Follow up**
- Day 3
- 6 weeks

Follow up low birth weight and high risk babies

- 3 days after discharge
- 2 weekly until 2.5kg
- 4 months
- 9 months

ROUTINE CARE AT BIRTH

These charts provide guidelines on the Routine Care to be provided to ALL babies at birth

Use these charts to manage babies from birth to the time of discharge home or transfer of a sick or small baby to the Neonatal Unit.

Use the Management of Sick and Small Newborn charts to provide care in the Neonatal Unit of your hospital.

Key to colours used in the charts on routine care

Urgent referral required after pre-referral treatment

Specific care and treatment now

Routine care, once complete baby can be discharged home



A. HELPING BABIES BREATHE

PREPARE FOR BIRTH

- Identify a nurse or helper to assist with care
- Review the emergency plan
- Prepare the area for delivery
- Wash hands
- Prepare area for ventilation and check equipment

ROUTINE CARE FOR BABY WHO IS CRYING AND BREATHING WELL

- Dry the baby thoroughly at birth
- If there is meconium, clear the airway first
- ASK: Is the baby crying?
- If the baby is crying keep warm and check breathing
- Clamp and cut umbilical cord in 1 – 3 minutes
- Keep warm, check breathing and initiate breastfeeding

GOLDEN MINUTE: CLEAR AIRWAY, STIMULATE

- Check breathing, if the baby is not breathing well
- Clear airway and stimulate
- Check breathing, if the baby is breathing well
- Keep warm and check breathing
- Clamp and cut the cord
- Keep skin-to-skin and initiate feeding

GOLDEN MINUTE: VENTILATE WITH BAG AND MASK

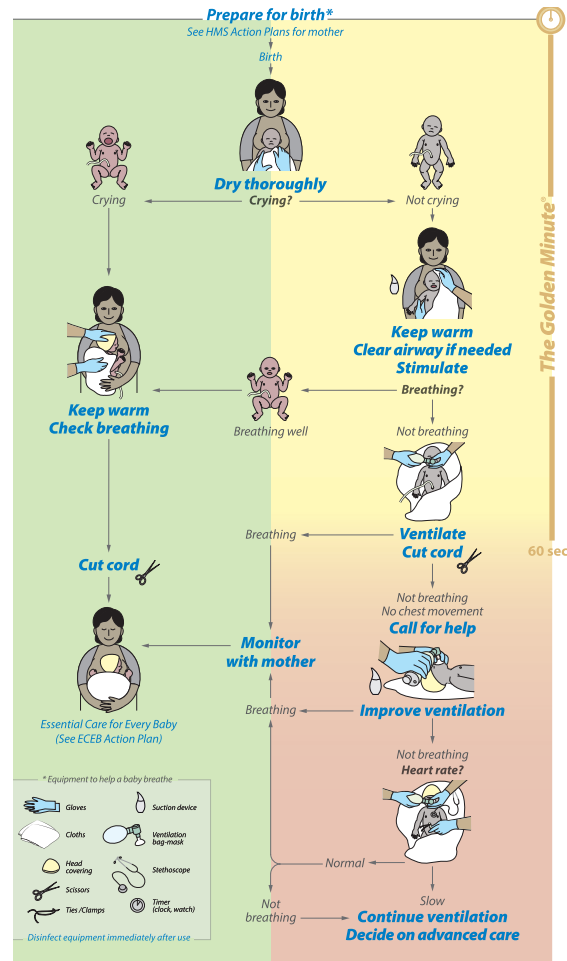
- If baby is still not breathing
- Clamp and cut the cord
- Ventilate with bag and mask
- Give 40 breaths per minute; count bag, 2,3, bag 2,3...
- Continue to ventilate until the baby is breathing well

CONTINUE VENTILATION

- Baby is still not breathing well
- Call for help and improve ventilation
- Check the heart rate
- If the heart rate is normal continue ventilation
- If the heart rate is slow baby requires advanced care
 - Improve ventilation
 - Start chest compression 1,2,3 Bag
 - Give Adrenaline 0,1 mg/kg 1:10000 IV

Stop resuscitation if:

- no heart beat or breathing at 10 minutes OR
- no breathing after 20 minutes OR
- only gasping after 30 minutes



B. RAPIDLY ASSESS BABY IMMEDIATELY AFTER BIRTH

Do a rapid assessment of baby soon after birth, to establish if baby needs any immediate care or referral to neonatal unit. Provide routine care and commence breastfeeding.

ASK, LOOK, LISTEN, FEEL	SIGNS	CLASSIFY	CARE, TREAT AND COUNSEL																																				
<p>Is the Apgar at 5 minutes < 8</p> <table border="1"> <thead> <tr> <th></th> <th>0</th> <th>1</th> <th>2</th> <th>1min</th> <th>5min</th> </tr> </thead> <tbody> <tr> <td>Crying?</td> <td>No response</td> <td>Grimace</td> <td>Vigorous cry</td> <td></td> <td></td> </tr> <tr> <td>Breathing?</td> <td>Absent</td> <td>Slow or irregular</td> <td>Good, crying</td> <td></td> <td></td> </tr> <tr> <td>Colour?</td> <td>Blue or pale</td> <td>Pink but blue feet</td> <td>Pink all over</td> <td></td> <td></td> </tr> <tr> <td>HR> 100?</td> <td>Absent</td> <td><100 / min</td> <td>>100 / min</td> <td></td> <td></td> </tr> <tr> <td>Is baby active?</td> <td>Limp</td> <td>Slight flexion</td> <td>Active, moves</td> <td></td> <td></td> </tr> </tbody> </table> <p>Did baby take more than 5 minutes to breathe on own? Observe the breathing. Is there?</p> <p><input type="checkbox"/> Grunting, in-drawing, fast breathing (> 60/min), or cyanosis</p> <p>Observe baby while lying on the back and then hold the baby and turn over. Observe for movement, tone and major abnormalities. Does the baby have?</p> <p><input type="checkbox"/> Increased or decreased tone <input type="checkbox"/> Less than normal movement <input type="checkbox"/> Major abnormality on back, abdomen or head</p> <p>Weigh baby, is the weight?</p> <p><input type="checkbox"/> >4,5kg <input type="checkbox"/> < 2kg</p> <p>Measure the Head circumference.</p> <p><input type="checkbox"/> Head circumference more than 39cm <input type="checkbox"/> OR, >P90 for gestational age</p> <p>Did the mother have diabetes in pregnancy?</p> <p>Poor feeding</p>		0	1	2	1min	5min	Crying?	No response	Grimace	Vigorous cry			Breathing?	Absent	Slow or irregular	Good, crying			Colour?	Blue or pale	Pink but blue feet	Pink all over			HR> 100?	Absent	<100 / min	>100 / min			Is baby active?	Limp	Slight flexion	Active, moves			<ul style="list-style-type: none"> • Took > 5 minutes to breathe • Apgar < 8 at 5 minutes • Grunting OR • Chest in-drawing OR • Fast breathing (RR>60) • Central cyanosis • Abnormal tone OR Not moving well • Major abnormality • Head circ. > 39cm • Low birth weight < 2 kg 	<p>POSSIBLE BIRTH ASPHYXIA</p> <p>and / or RESPIRATORY PROBLEM</p> <p>and / or SEVERE DISEASE</p> <p>and / or MAJOR BIRTH ABNORMALITY</p> <p>and / or LOW BIRTH WEIGHT < 2kg</p>	<ul style="list-style-type: none"> • Immediate drying and additional stimulation • Routine suction of newborn is not recommended • Delayed cord clamping (after 1-3min) is recommended for all births while initiating essential newborn care • Keep baby warm, in skin-to-skin or in a transport incubator • Check blood glucose, and treat if low (pg.8) • Put on saturation monitor and start oxygen if oxygen saturation is < 90% • Identify baby with mother • Administer vitamin K 1mg IM • Administer chloramphenicol eye prophylaxis into both eyes • Counsel about condition (pg.9) • If baby is breathing well, and not requiring oxygen and > 1,8kg: breastfeed baby. • Refer to Neonatal Unit for further assessment and care (pg.16)
	0	1	2	1min	5min																																		
Crying?	No response	Grimace	Vigorous cry																																				
Breathing?	Absent	Slow or irregular	Good, crying																																				
Colour?	Blue or pale	Pink but blue feet	Pink all over																																				
HR> 100?	Absent	<100 / min	>100 / min																																				
Is baby active?	Limp	Slight flexion	Active, moves																																				
	<ul style="list-style-type: none"> • Baby weighs > 4,5 kg • Mother has diabetes 	<p>INFANT OF DIABETIC MOTHER OR BIG BABY</p>	<ul style="list-style-type: none"> • Breastfeed or give EBM 3ml/kg every hour by cup • Check blood glucose every hour for 6 hours • If hypoglycaemic treat for low glucose (pg.8) • Administer vitamin K 1mg IM • Administer chloramphenicol eye prophylaxis into both eyes • Identify baby with mother and counsel 																																				
	<ul style="list-style-type: none"> • No abnormal signs or measurements 	<p>BABY IS WELL</p>	<ul style="list-style-type: none"> • Keep skin-to-skin with mother • Identify baby with the mother • Start breastfeeding (pg.10) • Do not give any prelacteal feeds or other supplemental feeds • Administer vitamin K 1mg IM • Administer chloramphenicol eye prophylaxis into both eyes • Transfer with mother to postnatal ward. 																																				

C. FULLY ASSESS BABY AFTER BIRTH IN POSTNATAL AREA / WARD

Assess the baby from top to toe in the first few hours after birth, when the baby is awake. Observe breast feeding. Classify and provide treatment and counselling

ASK	LOOK, LISTEN, FEEL	SIGNS	CLASSIFY	TREAT
Ask the mother if she has any concerns	Priority signs / Danger signs <ul style="list-style-type: none"> • Apnoea, central cyanosis • Fast breathing > 60 / min • Grunting OR chest in-drawing 	<ul style="list-style-type: none"> • Any priority sign • Not able to feed 	SEROUS ILLNESS	<ul style="list-style-type: none"> • Keep warm, skin-to-skin or in transport incubator (pg.8) • Give nasal prong oxygen if saturation is < 90% (pg.8) • Counsel mother and transfer to neonatal unit.
What was the duration of gestation?	<ul style="list-style-type: none"> • Reduced movements/lethargy • Irregular jerky movements • Decreased or increased tone • Fontanelle full • Abdominal distension • Pallor or jaundice • High /low temperature 	<ul style="list-style-type: none"> • Cleft palate or lip • Imperforate anus • Nose not patent • Macrocephaly >39 cm • Ambiguous genitalia • Boggy swelling of the head 	MAJOR AB-NORMALITY or Injury	<ul style="list-style-type: none"> • Keep skin-to-skin with the mother (pg.8) • Check blood glucose every 4 hours for 24 hours • Monitor 4 hourly RR, HR colour and activity, intake • Encourage breastfeeding on demand (8 – 12 times a day) • If mom cannot breastfeed initiate breast expression within 3 hours of delivery and thereafter 2 to 3 hourly. (pg.11) • Assess breastfeeding, if not able to suckle refer to NNU • Check weight every day to assess weight loss and weight gain
Ask mother how feeding is going	Major abnormality <ul style="list-style-type: none"> • Imperforate anus • Cleft lip of palate • Ambiguous genitalia • Nose not patent • Abnormal wall defect • Abnormalities of the spine 	<ul style="list-style-type: none"> • Microcephaly <32 cm • Club foot • Other abnormal signs 	BIRTH AB-NORMALITY	<ul style="list-style-type: none"> • Keep warm, skin-to-skin (pg.8) • Breastfeed on demand (8 – 12 times a day) • Assess feeding, if not able to feed transfer to the neonatal unit • Call doctor to assess or transfer to neonatal unit (NNU)
Assess baby while feeding (pg.10)	Head and Neck <ul style="list-style-type: none"> • Abnormal shape or sutures • Boggy swelling of head • Neck swellings, webbing Face, Eyes, Mouth and nose <ul style="list-style-type: none"> • Unusual appearance • Abnormal shape, slant of eyes • No light reflex Limbs, trunk <ul style="list-style-type: none"> • Abnormal position of limbs • Cries when limb touched, moved • Club foot • Abnormal fingers, toes and palms • Abnormal chest, back and abdomen • Undescended testis, hernia Weigh, measure length and head circumference, take temperature <ul style="list-style-type: none"> • Is temperature < 36 °C, or > 37,5°C • Is weight < 2kg, 2 – 2.5kg or > 4.5kg • If < 2.5 kg is gestation < 35 weeks • Head circumference< 32cm or >39cm 	<ul style="list-style-type: none"> • Birth weight 2 – 2.5kg or • Gestational age < 35 weeks 	LOW BIRTH WEIGHT 2 – 2.5KG	<ul style="list-style-type: none"> • Keep skin-to-skin with the mother • Check blood glucose every 4 hours for 24 hours • Monitor 4 hourly RR, HR colour and activity, intake • Encourage breastfeeding on demand (8 – 12 times a day) • If mom cannot breastfeed initiate breast expression within 3 hours of delivery and thereafter 2 to 3 hourly. • Assess breastfeeding, if not able to suckle refer to NNU • Check weight every day to assess weight loss and weight gain
		<ul style="list-style-type: none"> • Not moving a limb • Swelling of the head limited to skull bone(s) (Cephalohaematomata) • Severe bruising 	BIRTH IN-JURY	<ul style="list-style-type: none"> • Keep warm, skin-to-skin • Breastfeed on demand (8 – 12 times a day) • Assist and assess breastfeeding at every feed, if not able to suckle refer to neonatal unit • Observe for development of jaundice or anaemia • If jaundice develops then refer to neonatal unit • If not moving a limb, check mothers syphilis serology and refer
		<ul style="list-style-type: none"> • No abnormal signs 	HEALTHY BABY	<ul style="list-style-type: none"> • Room-in with the mother and keep warm • Encourage breastfeeding on demand (8 – 12 times a day) • Assist and assess breastfeeding, if not able to suckle refer to NNU • 6 hourly temp, HR, RR, colour, activity, and intake • Apply chlorhexidine (4%) to the cord every 6 hours • Wipe clean with a warm moist cloth, first face then head and body. Remove blood and meconium but NOT vernix.

D. ASSESS AND MANAGE RISK FACTORS OR SPECIAL TREATMENT NEEDS

ASK	LOOK, LISTEN, FEEL	SIGNS	CLASSIFY	TREAT	
<p>Mothers' RPR positive or unknown</p> <p>What is the mothers HIV status</p> <ul style="list-style-type: none"> • Positive • On ARV treatment • Not on treatment • If unknown or tested > 6 weeks ago repeat HIV-PCR and VL 	<ul style="list-style-type: none"> • Petechiae • Not moving limb • Hepatosplenomegaly • Rash on palms or soles 	<ul style="list-style-type: none"> • Mother's RPR positive and she is <ul style="list-style-type: none"> ◦ Untreated ◦ Partially treated ◦ Treatment completed < than 1 month ago • Mother's RPR is not known, and it is not possible to get the result now 	MOTHER HAS SYPHILIS	<ul style="list-style-type: none"> • Give the baby benzathine penicillin 50 000 u/kg IM as a single dose. (pg.57) • Check for signs of congenital syphilis (these should have been detected when looking for priority signs) and if present refer to neonatal unit for 10 days of treatment with procaine penicillin IM or penicillin G IV. (pg.57) • If congenital syphilis is suspected: do an LP 	
<p>Mother is on TB treatment?</p> <p>Mother blood group O or Rh Negative?</p>		<ul style="list-style-type: none"> • HIV exposed baby, assess if the baby is at high risk, or low risk 	HIV EXPOSED	Updated according 2019 PMTCT guidelines	<ul style="list-style-type: none"> • If low risk: start nevirapine (NVP) orally • If high risk: start NVP and zidovudine (AZT) • Check the latest PMTCT guidelines for duration and dose. • If mother is on ART: support her compliance • If mother not on ART, check her clinical stage and VL count and start her on ART
<p>Were the membranes ruptured for more than 18 hours?</p> <p>Was the liquor offensive?</p> <p>Was the mother feverish?</p>		<ul style="list-style-type: none"> • Mother has been on TB treatment for < 2 months OR • Mother is on TB treatment and not responding OR • AFB still positive 	MATERNAL TB HIGH RISK BABY IS SYMPTOMATIC		<ul style="list-style-type: none"> • Refer for evaluation for TB • If TB positive: start TB treatment according to the latest PMTCT guidelines • Give BCG 2 weeks after completion of treatment. (pg.58)
		<ul style="list-style-type: none"> • Mother has had > 2 months TB treatment and is responding well to treatment 	MATERNAL TB Updated 2017 EDL		<ul style="list-style-type: none"> • Baby to get INH for 6 months and BCG 2 weeks after completion of treatment (pg.58)
		<ul style="list-style-type: none"> • Mom Rh negative • Mom Blood group O 	RISK OF JAUNDICE		<ul style="list-style-type: none"> • Measure bilirubin at 6 hours of age • Commence phototherapy if bilirubin > 80mmol/L • Measure bilirubin 6 – 12hourly, refer to chart on pg.53, and transfer if baby requires phototherapy.
		<ul style="list-style-type: none"> • Membranes ruptured for more than 18 hours before delivery • Offensive liquor at birth 	RISK OF INFECTION		<ul style="list-style-type: none"> • Do observations every 4 hours for 24 – 48 hours • If clinical signs of infection or <2.5kg refer to neonatal unit, do FBC, CRP and blood culture, and start antibiotics • Repeat FBC and CRP 24 h after initiation of treatment, if normal and baby is well: discharge

E. PROVIDE ROUTINE TREATMENT TO THE WELL-BABY

KEEP BABY WARM	<p>Nurse baby skin-to-skin</p> <ul style="list-style-type: none"> Place the baby skin-to-skin between the mothers breasts Dress the baby with a cap, booties and nappy Cover the baby Secure the baby to the mother 	
GIVE OXYGEN IF SATS ARE <90% , OR THE BABY IS CYANOSIED	<p>If a baby has grunting or severe chest in-drawing put on a saturation monitor, if sats are < 90%, start nasal prong oxygen and transfer to Neonatal Unit</p> <ul style="list-style-type: none"> Place the prongs just below the baby's nostrils. Use 1mm prongs for small babies and 2mm prongs for term babies Secure the prongs with tape Turn on the oxygen and flow at 1 L per minute Humidification is not necessary 	
CHECK GLUCOSE AND TREAT LOW GLUCOSE	<p>If a baby has a severe classification or is an infant of a diabetic mother, check the glucose, and treat for hypoglycaemia</p> <p>HYPOGLYCAEMIA</p> <p>If the blood glucose is 1.4 - 2.5 mmol/L (If < 1,4 mmol/L take to neonatal unit and treat for severe hypoglycaemia)</p> <ul style="list-style-type: none"> Breastfeed or feed expressed breast milk. If breastfeeding is not possible then give 10ml/ kg appropriate replacement milk feed Repeat the blood glucose in 15 minutes If still low, or dropping below 1, 4 mmol/L refer to Neonatal Unit and treat for severe hypoglycaemia (pg.33) If the blood glucose is normal, continue with breastfeeding or EBM and check the blood glucose 2- 3 hourly 	
INFECTION PREVENTION AND CONTROL	<p>Cord care</p> <ul style="list-style-type: none"> Apply 4% chlorhexidine or surgical spirits to the cord every 6 hours. Leave the cord exposed to dry 	<p>Room-in and breastfeed</p> <ul style="list-style-type: none"> Baby to room-in with the mother, and breastfeed on demand Keep skin-to-skin
	<p>Hand washing</p> <ul style="list-style-type: none"> Wash hands before and after touching the baby Mother to wash hands after going to the toilet and before breastfeeding. 	<p>Bathing baby</p> <ul style="list-style-type: none"> Wipe baby with a warm cloth within the first 6 hours and daily. Wipe the face and head, then the body and perineum. Clean perineum after changing nappy, then wash your hands Bath only if blood and meconium need to be removed, or baby is smelly
GIVE ROUTINE TREATMENT AT BIRTH	<p>Eye prophylaxis</p> <ul style="list-style-type: none"> Administer chloramphenicol eye ointment into both eyes after birth 	<p>Vitamin K</p> <ul style="list-style-type: none"> Administer vitamin K 1mg IM in the anterolateral aspect of the mid-thigh
MONITOR	6 hourly monitoring of feeding, and intake, respiration, heart rate, activity and colour.	
IMMUNISATIONS AT BIRTH	<ul style="list-style-type: none"> When the baby is still admitted at 6 weeks, give appropriate immunisations Give BCG on discharge If < 6 weeks also give OPV0 and refer to clinic when six weeks old for six weeks immunisation. If 6 weeks or older, give all six weeks immunisations and refer to clinic after four weeks to receive 10 weeks immunisations 	



F. COUNSEL THE MOTHER: COUNSELLING SKILLS

Communication

- Be respectful and understanding
- Listen to the family's concerns and encourage them to ask questions and express their emotions
- Use simple and clear language
- Ensure that the family understands any instructions and give them written information
- If a baby needs to be transferred, explain the reason for the transfer and how the baby will be transferred
- If a baby has a poor prognosis, is not improving or has had a sudden deterioration, discuss this with the mother and explain the current management
- Respect the family's right to privacy and confidentiality
- Respect the family's cultural beliefs and customs, and accommodate the family's needs as much as possible
- Remember that parents may feel anger, guilt, sorrow, pain and frustration.
- Obtain informed consent before doing any procedures



Listening and learning skills

- Use helpful non-verbal behaviour.
- Ask open-ended questions.
- Use responses and gestures that show interest.
- Reflect back what the mother says.
- Avoid judging words.

Confidence building skills



- Accept what the mother says, how she thinks and feels.
- Recognise and praise what the mother is doing right.
- Give practical help.
- Give relevant information according to the mother's needs and check her understanding.
- Use simple language.
- Make suggestions rather than giving commands
- Reach an agreement with the mother about the way forward

Suggested steps in counselling

Assess	Assess knowledge and practise
Advise	Give advice
Ask checking questions	Check her understanding by asking checking questions
Agree	Agree on a management plan
Assist	Give practical help and suggestions to achieve the plan
Arrange	Follow up sessions as required

G. COUNSEL ON BREASTFEEDING, EXPRESSING BREAST MILK AND CUP FEEDING

Breastfeeding

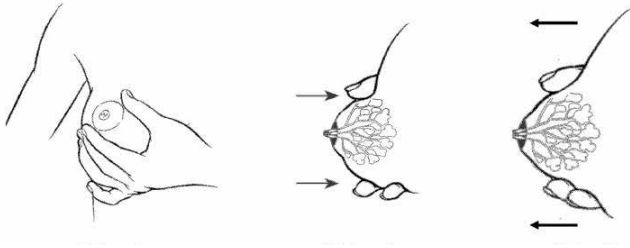
<p>Assist Mother with Breast Feeding</p>	<p>Help mother to position the baby for breastfeeding</p> <ul style="list-style-type: none"> • Seat the mother comfortably • Show the mother how to hold her baby • Baby's head and body must be in a straight line • Baby must face the mother's breast with nose opposite her nipple • Baby's body must be close to mother's body • Mother must support the baby's whole body (not just neck and shoulder's) with her arm along baby's back 	<p>Show mom how to help the infant attach.</p> <p>Mother should:</p> <ul style="list-style-type: none"> • Hold baby's nose opposite nipple. • Touch baby's lips to her nipple. • Wait until baby's mouth is open wide. • Move baby quickly onto her breast, aiming baby's lower lip well below the nipple • If attachment is not good, try again until baby attaches well. • Mother may need to try different feeding positions till she finds one that is more comfortable.
<p>Assess Attachment</p>	<p>Signs of good attachment:</p> <ul style="list-style-type: none"> • Chin touching the breast • Mouth open wide • Lower lip turned outwards • Baby has areola and nipple in mouth • More areola visible above than below the mouth • Mother must feel comfortable • Jaw movement clearly seen <p>Signs of poor attachment:</p> <ul style="list-style-type: none"> • Baby only has nipple in mouth • Chin not touching breast • Mouth points forwards and not open wide • Lower lip not turned outwards • Same amount of areola above and below baby's lips • Breast/nipple hurt during breastfeeding <p>Assess sucking</p> <ul style="list-style-type: none"> • Sucking in of infant's cheeks. Clicking sounds heard while infant is suckling. • Baby takes slow deep suckles with some pauses 	<p>If poor attachment</p> <ul style="list-style-type: none"> • Help mother to position the baby • Help mother with attachment <p>If mother has pain in the breast or pain on feeding</p> <ul style="list-style-type: none"> • Check the mother's breasts (pg.13) <p>If not suckling effectively</p> <ul style="list-style-type: none"> • Check that attachment is good • Check that baby is well and does not have a priority sign, e.g. floppy, lethargic, not moving well
<p>Support mother to breastfeed and provide help for any breastfeeding problems</p>	<p>Advise about breastfeeding</p> <ul style="list-style-type: none"> • Breastfeed baby on demand. Breastfeeds should not be timed. • Most newborns breastfeed 8 – 12 times a day every 2 – 3 hours • Reassure the mother that the more the baby suckles the more milk she will make • Encourage mother to feed first on one breast without a time limit before offering the second breast. This ensures that baby gets the rich hind milk • Start each new feed on the alternate breast, then both breasts will make a similar amount of milk 	<p>Breast feeding mothers</p> <ul style="list-style-type: none"> • Mother should drink extra fluids, at least 6 to 8 glasses of clean safe water. • Mother should eat a variety of food. Refer to the Mother, Child Health and Nutrition booklet. • Discourage the use of dummies or teats • Help mothers to recognise early hunger signs (feeding cues) e.g. sucking on hands or fingers, awake from sleep, making soft whimper sounds, restless, an increase eye movements • Discourage mix feeding.

Expressing Breast Milk & Cup Feeding

Assist mothers to express breast milk by hand.

EXPRESSING BREAST MILK

- Wash hands
- Make sure mom is sitting comfortably – a little forward
- Show her how to cup the breast just behind her areola
- Squeeze the breast gently, using thumb and the rest of fingers in a C shape. This shouldn't hurt (don't squeeze the nipple directly as you'll make it sore and unable to express).
- Release the pressure then repeat, building up a rhythm. Try not to let her slide her fingers over the skin. At first, only drops will appear, but if she keeps going this will help build up her milk supply. With practice and a little time, milk may flow freely.
- When no more drops come out, let her move her fingers round and try a different section of the breast.
- When the flow slows down, swap to the other breast. Keep changing breasts until the milk drips very slowly or stops altogether.
- If the milk doesn't flow, let her try moving her fingers slightly towards the nipple or further away, or give the breast a gentle massage.
- Hold a sterilized container below the breast to catch the milk as it flows.



CUP FEEDING

How to feed a baby with a cup (ideal for expressed breast milk):

- Hold the baby sitting upright or semi-upright on your lap
- Hold the small cup of milk to the baby's mouth. Tip the cup so that the milk just reaches the baby's lips. The cup rests lightly on the baby's lower lip and the edge of the cup touches the outer part of the baby's upper lip. The baby will become alert
- Do not pour milk into the baby's mouth: A low birth weight baby starts to take milk with the tongue. A bigger/ older baby sucks the milk, spilling some of it
- When finished, the baby closes the mouth and will not take any more. If the baby has not had the required amount, wait and then offer the cup again, or offer more frequent feeds



FLUIDS AND FEEDS FOR SICK AND VERY SMALL BABIES ON IV AND NASOGASTRIC OR CUP FEEDS

This table is a guideline, intended for use only if an experienced health care worker is not available. It is best to calculate fluids and feeds daily. Oral feeds should only be increased when tolerated well.

DAY OF LIFE	1		2		3		4		5		6-7+	
Total fluid > 1,5kg	60		75		100		125		150 (full feed)		150 - 180	
TOTAL FLUID 1 – 1,5KG	80		80		100		125		150		180	
TOTAL FLUID < 1KG	100		100		100		125		150		180	
	IVI*	ORAL*	IVI	Oral	IVI	Oral	IVI	ORAL	IVI	ORAL	IVI	Oral
< 1KG	4	0	3	2x12	3	4x12	2	8x12	0	12x12	0	15x12
1 - <1.2 KG	4	0	3	3	3	6	2	12	0	20	0	25
1.2 - <1.5 KG	4	0	3	4	3	9	2	15	0	25	0	30
1.5 - <1.75 KG	4	0	4	5	3	12	2	20	0	30	0	35
1.75 - <2.5 KG	5	0	4	6	3	15	2	25	0	35	0	45
2.5 - <3.5 KG	7	0	6	10	6	20	2	40	0	55	0	70
3.5 - <4.5 KG	10	0	8	15	6	25	4	50	0	75	0	90

Oral: ml / feed 3 hourly

Use this as a guide to determine how much IV fluid and feeds to give sick and small babies. If a baby is not tolerating the amount of oral feeds, then decrease the oral feeds and increase the IV fluids – ensure that the **total fluid volume** is correct for the baby's age and weight.

H. ASSESS AND CLASSIFY FOR BREAST PROBLEMS IN THE MOTHER

If mom has a problem with her breast, use this chart to assess, classify and treat the problem

ASK, CHECK, RECORD	SIGNS	CLASSIFY	TREAT AND ADVISE
Not enough milk? Pain or discomfort? • One or both breasts? • Pain in whole breast or localised? • Present between feeds?	<ul style="list-style-type: none"> • Mom feels that she does not have enough milk • Baby is not gaining weight and may cry 	NOT ENOUGH MILK	<ul style="list-style-type: none"> • Reassure the mother that she can produce enough and give practical help • Give mom enough to drink and eat • Ensure she has rest and manage any stress • Let baby feed on demand 8 – 12 times a day, empty one breast before starting on the other side • Check and correct feeding positioning and attachment
Lump in the breast?	<ul style="list-style-type: none"> • Hot, heavy breasts with no fever • Lumpy (disappears on feeding) • Milk flows easily 	FULL BREAST	<ul style="list-style-type: none"> • Demand feed reduces full breasts in first few days • Express a little first to soften areola and help the baby to attach
Does milk flow easily? Is there tightness around the nipple?	<ul style="list-style-type: none"> • Painful, red, shiny breast • Milk not flowing well • Nipple flat and tight 	BREAST ENGORGEMENT	<ul style="list-style-type: none"> • Check feeding position and attachment • Encourage feeding on demand, suckling helps drain the breasts • Express a little first as it may help to get the baby to attach • Warm compresses on breasts, massage back and neck, warm shower may help milk to flow
Maternal fever? Nipples painful/ shiny/ flaky?	<ul style="list-style-type: none"> • Painful breast • Localized redness • No fever • Mother feels well 	BLOCKED DUCT	<ul style="list-style-type: none"> • Check attachment, remove pressure of clothes • Give frequent feeds with gentle massage towards the nipple while feeding • Warm or cold compresses on breasts, massage back and neck, warm shower • Feed first using the affected breast
Cracked/ bleeding/ oozing pus? Mother feeding from both breasts?	<ul style="list-style-type: none"> • Severe pain in part of or whole breast with fever for more than 1 day • Painful, hard, red, shiny breast or part of breast • Maternal fever • Breast oozing pus 	MASTITIS OR BREAST ABSCESS	<ul style="list-style-type: none"> • Flucloxacillin 500 mg PO 6 hourly for 10 – 14 days OR • Erythromycin 500 mg PO 6 hourly for 10 – 14 days • Analgesia: Paracetamol 1 gm PO 6 hourly • Check and correct positioning and attachment • Feed baby on the unaffected side • Express milk from affected breast 8 - 12 times a day • Apply warm compresses or warm water to reduce the pain • Abscess requires surgical drainage: Refer to doctor
	<ul style="list-style-type: none"> • Painful nipple – no crack • Cracked nipple – no oozing or bleeding • Crack that is not healing 	PAINFUL NIPPLES	<ul style="list-style-type: none"> • Prevention by correct positioning and attachment • Encourage breast feeding on demand • Express a little first to soften areola and help the baby to attach • Gently rub expressed breast milk on the nipples for wound healing
	<ul style="list-style-type: none"> • Nipple may be red, shiny and flaky • Nipple painful, itchy, burning and stinging. • Check baby's mouth for thrush. 	BREAST THRUSH	<ul style="list-style-type: none"> • Treat the baby with nystatin 1ml (100 000u) orally and apply nystatin cream to the mother's breasts after each feed.
	<ul style="list-style-type: none"> • Nipple shape 	FLAT OR INVERTED NIPPLES	<ul style="list-style-type: none"> • Continued breastfeeding will correct the nipple shape • If baby cannot suckle effectively, help mother express and cup feed.

I. COUNSEL THE MOTHER WHO IS NOT BREASTFEEDING

Almost all mothers can breastfeed, however a small number may not be able to breastfeed due to personal or health conditions. To safely formula feed the mother needs to meet certain conditions. If formula feeding is right for her, educate and assist her to prepare and use formula feed safely

<p>Counsel the mother about breastfeeding</p>	<p>Does mom have a medical condition preventing her from breastfeeding</p> <ul style="list-style-type: none"> • She is on chemotherapy or radiotherapy • She has a chronic illness and is taking drugs that are harmful to the baby if she breastfeeds. Check if drugs perhaps can be changed • She is currently severely ill and cannot breastfeed, or express breast milk for the baby. <p><i>Note: TB treatment and ARV treatment are not contraindications to breastfeeding a baby.</i></p>				<p>If there is no medical indication to not breastfeed, counsel the mother</p> <ul style="list-style-type: none"> • Explain that breastfeeding is the perfect food for baby, it contains many antibodies and substances that help fight infections, mature the gut and body, and achieves optimal growth, development and health for the baby • The risk of not breast feeding is a much higher chance of the baby becoming ill with, or even dying from, diarrhoea, pneumonia and malnutrition. • If she is HIV positive, with ART treatment to the mother and prophylaxis to the baby, the risk of HIV transmission is low 																																
<p>If she still wants to formula feed, counsel further</p>	<ul style="list-style-type: none"> • She must purchase the formula to use at home herself, and be prepared to do this for 12 months. See the table below for the amount needed per month. (Affordable, Available, Sustainable) • Disclosure of her HIV status to relevant family will make it easier as she must give formula only and no breast milk (Acceptable) • Does the mother have access to safe clean water • Will she be able to prepare the formula safely 				<ul style="list-style-type: none"> • She must safely prepare milk before EACH of 6 – 8 feeds a day • She must clean and sterilise the equipment after each feed • Running water in the house and electricity and a kettle are advisable for safe preparation of 6 – 8 feeds a day. (Sustainable, Safe) • She should use a cup to feed the baby as it is safer than a bottle (Safe) • Discourage mix feeding. 																																
<p>Safe preparation of formula</p>	<table border="1"> <thead> <tr> <th>Age in months</th> <th>Weight (kg)</th> <th>No. and amount of feeds</th> <th>400 g tins per month</th> </tr> </thead> <tbody> <tr> <td>Birth</td> <td>3</td> <td>8 x 50 ml</td> <td>2</td> </tr> <tr> <td>2 weeks</td> <td>3</td> <td>8 x 50 ml</td> <td>4</td> </tr> <tr> <td>6 weeks</td> <td>4</td> <td>7 x 75 ml</td> <td>7</td> </tr> <tr> <td>10 weeks</td> <td>5</td> <td>6 x 125 ml</td> <td>8</td> </tr> <tr> <td>14 weeks</td> <td>6.5</td> <td>6 x 150 ml</td> <td>8</td> </tr> <tr> <td>4 months</td> <td>7</td> <td>6 x 175 ml</td> <td>8</td> </tr> <tr> <td>5 months or older</td> <td>8</td> <td>6 x 200 ml</td> <td>8</td> </tr> </tbody> </table>				Age in months	Weight (kg)	No. and amount of feeds	400 g tins per month	Birth	3	8 x 50 ml	2	2 weeks	3	8 x 50 ml	4	6 weeks	4	7 x 75 ml	7	10 weeks	5	6 x 125 ml	8	14 weeks	6.5	6 x 150 ml	8	4 months	7	6 x 175 ml	8	5 months or older	8	6 x 200 ml	8	<p>Advise her how to prepare the formula milk</p> <ol style="list-style-type: none"> 1. Formula milk must be prepared before EACH FEED 2. Wash your hands with soap and water 3. Boil water in a kettle or for 3 minutes in a pan and allow to cool 4. Read instructions on the tin very carefully to find out how many scoops of powder and water you need 5. Pour the amount of water needed in the cup, check that the water level is correct before adding the formula powder 6. Using the scoop supplied, add 1 scoop of formula powder to every 25ml of water (or manufacturer recommended amount) in the cup. 7. Stir with a clean spoon 8. Use the milk within an hour and discard any leftover infant formula
Age in months	Weight (kg)	No. and amount of feeds	400 g tins per month																																		
Birth	3	8 x 50 ml	2																																		
2 weeks	3	8 x 50 ml	4																																		
6 weeks	4	7 x 75 ml	7																																		
10 weeks	5	6 x 125 ml	8																																		
14 weeks	6.5	6 x 150 ml	8																																		
4 months	7	6 x 175 ml	8																																		
5 months or older	8	6 x 200 ml	8																																		
<p>How to cup feed</p>	<ul style="list-style-type: none"> • Hold the baby sitting upright or semi-upright on your lap • Hold the small cup of milk to the baby's mouth. • Tip the cup so that the milk just reaches the baby's lips. • The cup rests lightly on the baby's lower lip and the edge of the cup touches the outer part of the baby's upper lip. • Do not pour milk into the baby's mouth: A low birth weight baby starts to take milk with the tongue. A bigger/ older baby sucks the milk, spilling some of it • When finished the baby closes the mouth and will not take any more. If the baby has not had the required amount, wait and then offer the cup again, or offer more frequent feeds 				<p>Sterilise the utensils after each feed</p> <ul style="list-style-type: none"> • Wash the utensils, cup, knife and spoon in hot soapy water • Sterilise the cup by boiling in water for 5 minutes or soaking in a sterilising liquid such as Milton™, according to manufacturer's instruction 																																

J. DAILY REVIEW AND DISCHARGE

ASK	ASSESS	SIGNS	CLASSIFY	ACT
<p>Ask mother How is baby?</p> <p>How is feeding?</p> <p>Are the nappies wet?</p> <p>Has baby passed meconium?</p> <p>Is there any vomiting or drooling?</p> <p>Prophylactic treatment for HIV, Syphilis and TB given?</p>	<p>Assess breastfeeding</p> <ul style="list-style-type: none"> • Feeding 8 times or more • Well attached <ul style="list-style-type: none"> ◦ Chin touching the breast. ◦ Mouth open wide ◦ Lower lip turned outwards ◦ More areola visible above than below the mouth • Is baby suckling well (that is, slow deep sucks sometimes pausing) <p>Check weight</p> <ul style="list-style-type: none"> • Check that baby is gaining weight or has not lost more than 10% of weight since birth <p>Examine baby</p> <ul style="list-style-type: none"> • Level of alertness • Tone • Breathing • Jaundice, especially if hands and feet are jaundiced • Skin • Eyes for infection • Umbilicus and umbilical cord 	<ul style="list-style-type: none"> • Not able to feed • Drooling • Vomiting • Lethargic or floppy • Jaundice on Day 1 • Jaundice of the hands and feet 	POOR FEEDING OR SERIOUS ILLNESS	<ul style="list-style-type: none"> • Refer URGENTLY to Neonatal Unit in hospital • Test for low blood sugar and treat or prevent low blood sugar PG • Keep warm
		<ul style="list-style-type: none"> • Jaundiced 	JAUNDICE	<ul style="list-style-type: none"> • Check bilirubin and check chart on pg. • Review risk factors
		<ul style="list-style-type: none"> • Skin pustules • Eye problem • Not passed meconium • Other problem 	LOCAL PROBLEM	<ul style="list-style-type: none"> • Consult Neonatal Unit or doctor for assessment and management • See pg.22
		<ul style="list-style-type: none"> • Weight loss excessive • Feeding problem • Not passed urine 	FEEDING PROBLEM	<ul style="list-style-type: none"> • Assess attachment and assist with feeding • If mother has a breast problem, assess and treat (pg.13)
		<ul style="list-style-type: none"> • Weight gain or no excessive loss • Completed observation for infection for 48 hours • All prophylactic and preventative treatment administered. • If risk of jaundice, bilirubin checked and below line of treatment 	BABY WELL	<ul style="list-style-type: none"> • Prepare for discharge • Check vitamin K and eye prophylaxis were given • Give BCG and OPV0 • Document information in the RTH Booklet <ul style="list-style-type: none"> ◦ Details of child and family ◦ Neonatal information ◦ Immunisation ◦ PMTCT/HIV information Counsel mom on <ul style="list-style-type: none"> • Exclusive breastfeeding • Play and communication • Well child visits for comprehensive assessments • Growth monitoring and immunisation • HIV and TB prevention and care • Supplementation when required • Follow up at 3 – 6 days and 6 weeks

MANAGEMENT OF SICK AND SMALL NEWBORNS IN DISTRICT HOSPITALS

Use these charts as a guideline to care for sick and small newborns in district hospitals from birth to 28 days or discharge from hospital. They may also be used to care for babies in Community Health Centres or Midwife Obstetric Units. Local policies will then be required to decide when the mother and baby should be referred to hospital.

ASSESS AND CLASSIFY

1.1 Assess need for emergency care

1.2 Assess priority signs

- Apnoea
- Respiratory distress
- Low birth weight
- Temperature
- Colour and skin
- Tone, movement and fontanel
- Abdominal signs

1.3 Assess for injuries, abnormalities or local infection

1.4 Assess risk factors and special treatment needs

KEY TO COLOURS USED IN THE CHARTS BOOKLET

EMERGENCY CARE

Immediate life-threatening situation; provide emergency care

IMMEDIATE CARE

Potential life-threatening situation; provide immediate care

URGENT SPECIALISED CARE

Provide care and refer as soon as possible

NON-URGENT SPECIALISED CARE

Provide care and referral

Care and treatment needed as soon as possible

Baby can be **discharged** home



1.1 ASSESS AND CLASSIFY: ASSESS NEED FOR EMERGENCY CARE

Rapidly assess all newborns on arrival in the neonatal ward, casualty or outpatients for emergency or priority sign to assess the need for emergency care.

ASK, CHECK, RECORD	LOOK, LISTEN, FEEL	SIGNS	CLASSIFY	TREAT AND ADVISE
<p>Whilst assessing the baby, ask the mother or caregiver what is wrong with baby and check any letters or records?</p> <p>When was the baby born?</p>	<p>Assess breathing</p> <ul style="list-style-type: none"> • Is baby breathing? • Is baby gasping? • Count the respiratory rate. Is it < 20 breaths / minute? • Is the baby's tongue blue? <p>Assess circulation</p> <ul style="list-style-type: none"> • Count the heart rate. Is the Heart rate < 100 • Does baby have severe pallor? • Is the baby lethargic or unconscious? <p>Assess for hypoglycaemia in any small or sick baby</p> <ul style="list-style-type: none"> • Check blood glucose with glucose test strip <p>Assess for hypothermia</p> <ul style="list-style-type: none"> • Check the temperature 	<ul style="list-style-type: none"> • Not breathing at all <u>OR</u> • Gaspings <u>OR</u> • RR < 20 <u>OR</u> • Heart rate < 100 <u>OR</u> • Tongue blue 	RESPIRATORY FAILURE	<ul style="list-style-type: none"> • Resuscitate the baby using a bag and mask • Give oxygen (pg.28-32) • Call for help • Keep warm (pg.25-27) • Manage in Neonatal Unit
		<ul style="list-style-type: none"> • HR > 180 <u>OR</u> • Pallor <u>OR</u> • Lethargy <u>OR</u> • Unconscious 	CIRCULATORY FAILURE	<ul style="list-style-type: none"> • Give oxygen (pg.28-32) • Call for help • Establish an IV line • Infuse normal saline 10 ml/ kg 15 minutes, repeat if necessary • Infuse Neonatalyte or dextrose 10% at recommended volume for weight and age. (pg.34-35) • Keep warm (pg.25-27) • Check blood glucose • Check vitamin K administration
		<ul style="list-style-type: none"> • Glucose < 2,6 mmol / l 	SEVERE HYPOGLYCAEMIA	<ul style="list-style-type: none"> • If the blood glucose is < 1.5 mmol/L, or baby ill give 2ml / kg of 10% glucose IV • If the blood glucose is 1.5 – 2.5 and baby can feed, breastfeed or give EBM 10ml/kg PO immediately • For further care see (pg.33)
		<ul style="list-style-type: none"> • Temperature is less than 35°C 	SEVERE HYPOTHERMIA	<ul style="list-style-type: none"> • Re-warm (pg.25-27) • Set up a 10% glucose infusion and monitor the glucose • Keep nil per mouth until re-warmed • Administer oxygen by nasal prongs until the temperature is normal, where after oxygen administration is guided by saturation • Start antibiotics after taking bloods for FBC CRP and BC

1.2 ASSESS AND CLASSIFY: PRIORITY SIGNS

Check all babies for priority signs and **ACT NOW** to manage priority problems.

ASK, CHECK, RECORD	LOOK, LISTEN, FEEL	SIGNS	CLASSIFY	ACT NOW
<p>What is the baby's current problem?</p> <p>Is the baby having a problem with feeding?</p> <p>Has the baby had a history of convulsions or abnormal movements?</p>	<p>Assess respiration</p> <ul style="list-style-type: none"> Count the breaths in one minute. Listen for grunting Look for severe chest in-drawing Does baby have apnoea? (Baby stops breathing for more than 20 seconds) <p>Assess colour</p> <ul style="list-style-type: none"> Central cyanosis (blue tongue) 	<ul style="list-style-type: none"> No breaths for >20 seconds and needs stimulation 	APNOEA	<ul style="list-style-type: none"> Gentle physical stimulation or ventilate with bag and mask Manage for apnoea (pg.39)
		<ul style="list-style-type: none"> Severe chest in-drawing, <u>AND / OR</u> Grunting, <u>AND / OR</u> RR >80 breaths per minute 	SEVERE RESPIRATORY DISTRESS	<ul style="list-style-type: none"> Check O2 saturation, if it is < 90%, or cyanosis start oxygen (pg.28-32) If preterm and nasal CPAP is available, commence nasal CPAP (pg.28-32) Monitor the response to oxygen (pg.28-32) Mobile CXR (pg.39) Observe hourly Determine cause and specific treatment (pg.39) Start IV fluids Keep nil by mouth for 24 hours Treat, care and observe (pg.40)
		<ul style="list-style-type: none"> RR 60-80 breaths per minute but NO cyanosis, grunting or only mild chest in-drawing 	MILD RESPIRATORY DISTRESS	<ul style="list-style-type: none"> Check O2 saturation – if it is <90% give oxygen Reassess in half hour, if worsening manage as severe respiratory distress Observe hourly initially Start antibiotics if at risk for infection CXR if no improvement after 6 hrs. (pg.39)
		<ul style="list-style-type: none"> Central cyanosis and no chest in-drawing or grunting and no increase in saturation after administering O2 	POSSIBLE HEART ABNORMALITY	<ul style="list-style-type: none"> Consult specialist for further advice, referral and possible use of Prostaglandin E2 and consider (to stop) O2 therapy despite low saturation in consultation with a specialist.

1.2 ASSESS AND CLASSIFY: PRIORITY SIGNS (continued)

Check all babies for priority signs and **ACT NOW** to manage priority problems.

ASK, CHECK, RECORD	LOOK, LISTEN, FEEL	SIGNS	CLASSIFY	ACT NOW		
Baby's birth weight Baby's current weight Document findings in the newborn record.	<p>Assess for low birth weight</p> <p>Assess temperature Axillary temperature (Use a thermometer which reads below 35°C)</p> <p>Assess tone, movement and fontanelle</p> <ul style="list-style-type: none"> Decreased tone (floppy) Increased tone (stiff) Irregular jerky movements (convulsions) Reduced activity Lethargic Full fontanelle <p>Assess abdominal signs</p> <ul style="list-style-type: none"> Abdominal distension Vomiting bile or blood <p>Assess colour</p> <ul style="list-style-type: none"> Jaundice Anaemia 	<ul style="list-style-type: none"> Birth weight <1kg → 	EXTREMELY LBW	<ul style="list-style-type: none"> Ensure warmth Commence fluids or feeds (pg.34-35) Check blood glucose (pg.33) See low birth weight chart (pg.41-45) Admit to Neonatal Unit Check saturation 		
		<ul style="list-style-type: none"> Birth weight 1-1.49kg → 	VERY LBW	<ul style="list-style-type: none"> Birth weight 1.5-1.99kg → 	LBW (<2kg)	<ul style="list-style-type: none"> Re-warm (pg.25-27) Keep warm (pg.25-27) Check blood glucose (pg.33)
		<ul style="list-style-type: none"> Temp <36.0°C 	HYPOTHERMIA	<ul style="list-style-type: none"> Temp <35.0°C or Temp >38°C or Not feeding or Decreased tone or Increased tone or Irregular jerky movement or Reduced activity or Full fontanelle or Boggy swelling of head extending down neck or Anaemia or Abdominal distension or Vomiting bile or Jaundice in the first 24hours 	SEVERE DISEASE (consider sepsis)	<ul style="list-style-type: none"> Re-warm (pg.25-27) Keep warm (pg.25-27) Give O2 if saturation <90% Treat convulsions if present (pg.52) Commence IV infusion at the maintenance rate (pg.34-35) Check blood glucose now and 3 hourly (pg.33) Check for risk factors and determine the cause (pg.23,49,50) Start specific treatment (pg.49- 50) If abdomen distended, pass a naso/ orogastric tube and leave on open drainage Reassess hourly
		<ul style="list-style-type: none"> Jaundice after the first 24 hours 	JAUNDICE	<ul style="list-style-type: none"> Birth weight 2-2.5kg 	LBW (2-2.5kg)	<ul style="list-style-type: none"> Determine the bilirubin level and manage (pg.53-54) Determine the cause (pg.53) Place in KMC position with the mother in post-natal or KMC ward Manage according to LBW guideline (pg.41-45)

1.3 ASSESS AND CLASSIFY FOR INJURIES, ABNORMALITIES AND LOCAL INFECTIONS

Assess all babies for any birth injuries or abnormalities that may be present.

ASK, CHECK, RECORD	LOOK, LISTEN, FEEL	SIGNS	CLASSIFY	TREAT AND ADVISE
<p>Ask the mother:</p> <p>“Have you noticed anything abnormal or of concern?”</p> <p>“Has the baby passed meconium?”</p> <p>Document findings and the result of consultations (with whom) in the newborn record.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>THIS CHART, OF COURSE, DOES NOT COVER ALL ABNORMALITIES AND LOCAL PROBLEMS. CONSULT STANDARD TEXTS, OR THE LOCAL REFERRING CENTRE FOR ADVICE ON PROBLEMS NOT COVERED HERE.</p> </div>	<p>Assess the baby from head to toe:</p> <p>Head and face</p> <ul style="list-style-type: none"> • Head circumference • Swelling of scalp • Unusual appearance <p>Mouth and nose</p> <ul style="list-style-type: none"> • Cleft lip and / or palate • Nostrils patent <p>Abdomen and back</p> <ul style="list-style-type: none"> • Gastroschisis / omphalo-coele • Spina bifida / myelo-meningo-coele • Imperforate anus • Ambiguous genitalia <p>Limbs</p> <ul style="list-style-type: none"> • Abnormal position • Poor limb movements (look at femur or clavicle) • Baby cries when leg, arm or shoulder is touched • Club foot • Extra finger or toe • Swollen limb / joint <p>Skin and Umbilicus</p> <ul style="list-style-type: none"> • Pustules / rash • Umbilicus red / pus <p>Eyes</p> <ul style="list-style-type: none"> • Pus draining from eye • Eyelid red or swollen <p>Other</p>	<ul style="list-style-type: none"> • Open tissue on the head or back 	NEURAL TUBE DEFECT / SPINA BIFIDA	<ul style="list-style-type: none"> • Cover the lesion with opsite or cling film • See pg.55-56
		<ul style="list-style-type: none"> • Omphalocoele • Gastroschisis • Imperforate anus, not passed meconium in 24 hours 	MAJOR GASTROINTESTINAL ABNORMALITY	<ul style="list-style-type: none"> • Commence IV fluids (pg.34-35) • Keep nil by mouth • Cover the defect with sterile opsite or cling film • Immediate referral required
		<ul style="list-style-type: none"> • Head circumference above the 90th centile on the foetal infant growth chart (pg.75) 	MACROCEPHALY	<ul style="list-style-type: none"> • Refer for neuro-imaging and possible neuro-surgery • See pg.55-56
		<ul style="list-style-type: none"> • Uncertainty of the gender of the baby 	AMBIGUOUS GENITALIA	<ul style="list-style-type: none"> • Refer immediately • Counsel parents
		<ul style="list-style-type: none"> • Head circumference < 3rd centile on foetal infant growth chart (pg.75) 	MICROCEPHALY	<ul style="list-style-type: none"> • Assess for other abnormalities • See pg.55 • Counsel the parents
		<ul style="list-style-type: none"> • Club foot 	CLUB FOOT	<ul style="list-style-type: none"> • If other abnormalities or abnormal tone refer to a paediatrician • Refer to orthopaedic service for early serial plasters • See pg.56
		<ul style="list-style-type: none"> • Cleft lip and / or palate 	CLEFT LIP AND / OR PALATE	<ul style="list-style-type: none"> • If other problems refer to a paediatric service • Assist with feeding, breast feeding or EBM • Refer to a “cleft lip / palate service” • See pg.56
		<ul style="list-style-type: none"> • One major abnormality and two minor abnormalities <u>OR</u> • 3 other minor abnormalities 	OTHER MAJOR CONGENITAL ABNORMALITY	<ul style="list-style-type: none"> • Baby may have a chromosomal problem, discuss investigation and management with paediatrician • See pg.56

1.3 ASSESS AND CLASSIFY FOR INJURIES, ABNORMALITIES AND LOCAL INFECTIONS *(continued)*

Assess all babies for any birth injuries or abnormalities that may be present.

ASK, CHECK, RECORD	LOOK, LISTEN, FEEL	SIGNS	CLASSIFY	TREAT AND ADVISE
		<ul style="list-style-type: none"> One or two minor abnormalities 	MINOR ABNORMALITY	<ul style="list-style-type: none"> If the child has an extra digit on a narrow pedicle, it may be tied off Dependent on the problem, refer for further management
		<ul style="list-style-type: none"> Swelling confined to skull bone(s) 	CEPHALHAEMATOMA	<ul style="list-style-type: none"> Counsel the parents Handle gently Check for subsequent jaundice
		<ul style="list-style-type: none"> Abnormal position of legs or arm Poor limb movement Pain on movement of the limb 	LIMB INJURY	<ul style="list-style-type: none"> X-ray to look for syphilis or a fracture If there is a fracture or syphilis treat If the arm is not moving and flaccid a brachial plexus palsy is likely, refer to physiotherapy, and, if not improving to orthopaedic surgery
		<ul style="list-style-type: none"> Blisters containing pus in the skin Blisters rupture leaving reddish dry skin 	STAPH SKIN SEPSIS	<ul style="list-style-type: none"> If severe do a blood culture, gram stain and culture of pus Wash with antiseptic soap 12 hourly If a few small blisters give oral flucloxacillin If extensive or the baby is ill give cloxacillin IV for 7 – 10 days
		<ul style="list-style-type: none"> Pussy discharge from the umbilicus Redness and swelling of the skin around the umbilicus 	OMPHALITIS	<ul style="list-style-type: none"> Clean the base of the cord with surgical spirits or chlorhexidine 3 – 4 times a day Benzyl penicillin and gentamycin for 5 – 7 days
		<ul style="list-style-type: none"> Pussy discharge Red conjunctivae Oedema of the eyelid 	SEVERE CONJUNCTIVITIS	<ul style="list-style-type: none"> Ceftriaxone* IMI one dose only PLUS Erythromycin for 10 – 14 days Irrigate eye with clean water 2 hourly Chloramphenicol eye ointment 2 hourly
		<ul style="list-style-type: none"> Mild eye discharge with no swelling and no red conjunctivae 	BLOCKED NASOLACRIMAL DUCT	<ul style="list-style-type: none"> Teach mother to massage: start at the lower lacrimal punctum, downwards to the nose, several times per day.

1.4 ASSESS AND CLASSIFY: RISK FACTORS AND SPECIAL TREATMENT NEEDS

Evaluate for maternal and perinatal conditions that may put the baby at risk of serious illness.

ASK, CHECK, RECORD	SIGNS	CLASSIFY	TREAT AND ADVISE
Review and record the history of the mother's pregnancy, labour, birth and resuscitation of the baby	<ul style="list-style-type: none"> • Mother has diabetes, <u>OR</u> • Baby weighs > 4,5 kg, <u>OR</u> • Baby is low birth weight < 2,5kg or premature • Baby has SEVERE DISEASE 	RISK OF HYPOGLYCAEMIA	<ul style="list-style-type: none"> • Feed immediately, or IV line • Hourly glucose for 6 -12 hours if mother diabetic otherwise 3 hourly for 24 hours • Treat hypoglycaemia (pg.33)
Pregnancy <ul style="list-style-type: none"> • Duration of pregnancy • Mother diabetic • Mother has had TB in the last 6 months • Mother tested RPR positive or is unknown • Mother tested HIV positive or status is unknown • Mother is Rh negative or blood group O 	<ul style="list-style-type: none"> • Mother Rhesus negative <u>OR</u> • Mother blood group O <u>OR</u> • Baby has birth injuries 	RISK OF JAUNDICE	<ul style="list-style-type: none"> • Measure bilirubin at 6 hours • Commence phototherapy if bilirubin > 80 mmol/L at 6 hours of age or according to chart (pg.53-54)
Labour and birth <ul style="list-style-type: none"> • Uterine infection or fever • Membranes ruptured for > 18 hours • Difficult labour • Complications after birth • Apgar score < 8 at 5 minutes 	<ul style="list-style-type: none"> • Membranes ruptured > 18 hours <u>OR</u> • Maternal fever <u>OR</u> • Offensive smell of liquor at birth 	RISK OF BACTERIAL INFECTION	<ul style="list-style-type: none"> • If clinical signs of infection or VLBW • Do FBC, CRP and blood culture • Treat with penicillin G and gentamycin for 5 days unless CRP is normal at 2 days and BC is still negative • Repeat FBC and CRP after 24 hours, if normal and if the baby is well, the baby can be discharged.
	<ul style="list-style-type: none"> • Apgar score <8 at 5 minutes <u>OR</u> • Baby did not breathe on own until 5 minutes 	RISK OF NEONATAL ENCEPHALOPATHY	<ul style="list-style-type: none"> • Observe for at least 12 hours • Evaluate and manage for neonatal encephalopathy (pg.51) • Do an HIE score and document • Consult with referral centre ASAP to discuss eligibility for therapeutic hypothermia
	<ul style="list-style-type: none"> • Mother tested RPR positive <u>OR</u> • Mother's RPR not known <u>OR</u> • Mother partially treated 	RISK OF CONGENITAL SYPHILIS	<ul style="list-style-type: none"> • Evaluate and manage according to the congenital syphilis protocol (pg.57)
	<ul style="list-style-type: none"> • Mother HIV positive <u>OR</u> • Unknown maternal HIV status 	RISK OF HIV TRANSMISSION	<ul style="list-style-type: none"> • Manage according to the HIV guideline – always refer to latest (2019) SA guidelines
	<ul style="list-style-type: none"> • Mother started TB treatment within the past 6 months <u>OR</u> • Mother coughing for > 2 weeks 	RISK OF TUBERCULOSIS	<ul style="list-style-type: none"> • Manage according to the TB protocol

PRINCIPLES OF NEWBORN CARE AND TREATMENT

- 2.1 Maintain normal body temperature
- 2.2 Safe oxygen therapy
- 2.3 Maintain normal glucose
- 2.4 Feeds and fluids for sick and small babies
- 2.5 Infection prevention and control



2.1 MAINTAIN NORMAL BODY TEMPERATURE: PREVENT AND TREAT HYPOTHERMIA

The baby who is preterm and/or low birth weight needs additional warmth to maintain body temperature.

PREVENT HYPOTHERMIA

<p>Dry the baby well at birth</p> <p>Keep the baby warm:</p> <ul style="list-style-type: none"> • Provide 'skin-to-skin' care with the mother • Babies in 'skin-to-skin' to have caps, booties and nappies only • If baby not receiving 'skin-to-skin', keep the baby covered or clothed including booties and a cap • Uncover only parts that need observation and treatment • Change the nappy when it is wet • Delay bathing until after 24 hours, preferably 'top and tail' to clean <p>Feed the baby early</p> <ul style="list-style-type: none"> • Encourage early breastfeeding • Feed the baby and check the blood glucose if appropriate 	<p>Maintain a warm environment in the newborn unit</p> <ul style="list-style-type: none"> • Keep the room at 24 - 25°C • Check the wall thermometer 4x/day to ensure the temperature is correct • Keep the room free of draughts • Do not place the baby or incubator on or near cold objects (examination table, wall, window) • Ensure warmth during procedures • Draw curtains at night or if it is cold outside <p>Observe body temperature</p> <ul style="list-style-type: none"> • Hourly if <1.2kg and serious infection • 3 hourly in babies 1.2-1.5kg • 6 hourly in babies >1.5kg and stable
--	--

TREAT HYPOTHERMIA

<p>Temp <35°C OR 35 - 36°C AND Signs of severe disease</p>	<p>SEVERE HYPOTHERMIA</p>	<ul style="list-style-type: none"> • Warm using a pre-warmed incubator at 38°C or radiant heater • Remove cold clothing and/or cold wrapping • Measure the temperature after 30 minutes and half hourly until normal. • Make sure baby is getting warm • Treat for sepsis (pg.49) • Give IV fluids and monitor the blood glucose; keep nil by mouth until re-warmed • Give oxygen by nasal prongs until the baby's temperature is normal, thereafter give oxygen if saturation is <90%. • Continually reassess for emergency signs. The baby is at risk of apnoea and cardio-respiratory failure
<p>Temp 35-36°C AND NO Signs of severe disease</p>	<p>HYPOTHERMIA</p>	<ul style="list-style-type: none"> • If the baby is stable, re-warm the baby using skin to skin contact with the mother • If the baby is not stable manage as for Severe Hypothermia • Measure the blood glucose and feed • Measure the baby's temperature every hour, aiming for an increase of 0.5°C every hour.

2.1 MAINTAIN NORMAL BODY TEMPERATURE: METHODS

The baby who is preterm and/or low birth weight needs additional warmth to maintain body temperature. Term babies also need to be kept warm, and not exposed to cold.

METHOD	INDICATIONS	METHOD
Skin-to-Skin	<ul style="list-style-type: none"> • Baby immediately after birth • Baby < 2.5kg who are stable • To re-warm babies with hypothermia • To transport a baby in an ambulance if baby is reasonably stable 	<ul style="list-style-type: none"> • Dress the baby with a cap, booties and nappy • Place the baby skin-to-skin on the mothers chest • DO NOT wrap the baby, but just cover the baby • Secure the baby to the mother
Servo-controlled Closed and Open incubators	<ul style="list-style-type: none"> • Babies with severe disease including severe hypothermia • Babies with very and extreme low birth weight • Babies who require <ul style="list-style-type: none"> ◦ CPAP / IPPV ◦ Resuscitation ◦ Exchange transfusion • Closed servo-controlled incubators can be better for very small babies • Open servo-controlled incubators may be more convenient for babies requiring procedures • Remove cold clothes and cold blankets 	<p>Closed servo-control incubator</p> <ul style="list-style-type: none"> • Switch the control to manual (AIR) and preheat to 37°C • Place the baby in the incubator and attach the temperature probe to the baby's skin (The left side of the abdomen is best) • Make sure that the cable from the baby's skin is correctly plugged into the incubator • Switch the incubator control from manual (AIR) to servo-controlled (SKIN) • Set the required skin temperature to 36.5°C on the control panel • The actual skin temperature will be displayed on the panel • After 30 minutes check that the baby's skin temperature is the same as the required temperature. If not then the skin probe may not be correctly applied or the incubator may be malfunctioning • Check the temperature of both baby and incubator every hour in a baby with hypothermia, until the temperature is normal • A heat shield or plastic covering will prevent heat loss through radiation and convection <p>Open servo-control incubator</p> <ul style="list-style-type: none"> • Uses radiant heat to warm the baby • Set as for servo-controlled closed incubator. The temperature probe is taped to the baby's skin and the skin temperature set to 36.5°C • The baby needs to be undressed and exposed except for a nappy, cap and booties • A heat shield or plastic covering will prevent heat loss through radiation and convection <p>NOTE: If the skin probe comes loose, the incubator may continue to warm up and the baby will become TOO HOT! (hyperthermia)</p>

2.1 MAINTAIN NORMAL BODY TEMPERATURE: METHODS (continued)

METHOD	INDICATIONS	METHOD																																																					
Manual Incubators	<ul style="list-style-type: none"> When you do not have servo-control incubators <u>OR</u> the servo-control incubator is malfunctioning, and you need to set it to manual mode 	<ul style="list-style-type: none"> Place the baby in a warm (37°C) clean incubator Determine the recommended incubator temperature for your baby. Use Table 1 Set the incubator to this temperature Measure the incubator and baby's temperature after 30 minutes and adjust the incubator temperature if the baby's temperature is not normal (36.5 - 37.5°C) Once stable, monitor the incubator and baby's temperature 3 hourly as part of routine observations. Alter the incubator temperature whenever the baby's temperature is outside the normal range 																																																					
		<p>TABLE 1: TEMPERATURE CHART FOR INCUBATORS</p> <table border="1"> <thead> <tr> <th rowspan="2">Birth weight</th> <th colspan="7">Days after delivery</th> </tr> <tr> <th>1</th> <th>5</th> <th>10</th> <th>15</th> <th>20</th> <th>25</th> <th>30</th> </tr> </thead> <tbody> <tr> <td>1000g</td> <td>35.5</td> <td>35.0</td> <td>35.0</td> <td>34.5</td> <td>34.0</td> <td>33.5</td> <td>33.0</td> </tr> <tr> <td>1500g</td> <td>35.0</td> <td>34.0</td> <td>33.5</td> <td>33.5</td> <td>33.0</td> <td>32.5</td> <td>32.5</td> </tr> <tr> <td>2000g</td> <td>34.0</td> <td>33.0</td> <td>32.5</td> <td>32.0</td> <td>32.0</td> <td>32.0</td> <td>32.0</td> </tr> <tr> <td>2500g</td> <td>33.5</td> <td>32.5</td> <td>32.0</td> <td>31.0</td> <td>31.0</td> <td>31.0</td> <td>31.0</td> </tr> <tr> <td>3000g</td> <td>33.0</td> <td>32.0</td> <td>31.0</td> <td>30.0</td> <td>30.0</td> <td>30.0</td> <td>30.0</td> </tr> </tbody> </table> <p>If the baby remains cold despite the recommended temperature, then:</p> <ul style="list-style-type: none"> The room is too cold, or the incubator is near a window The baby has an infection The incubator is malfunctioning Use a heat shield or plastic covering, this will prevent heat loss through radiation and convection 	Birth weight	Days after delivery							1	5	10	15	20	25	30	1000g	35.5	35.0	35.0	34.5	34.0	33.5	33.0	1500g	35.0	34.0	33.5	33.5	33.0	32.5	32.5	2000g	34.0	33.0	32.5	32.0	32.0	32.0	32.0	2500g	33.5	32.5	32.0	31.0	31.0	31.0	31.0	3000g	33.0	32.0	31.0	30.0	30.0
Birth weight	Days after delivery																																																						
	1	5	10	15	20	25	30																																																
1000g	35.5	35.0	35.0	34.5	34.0	33.5	33.0																																																
1500g	35.0	34.0	33.5	33.5	33.0	32.5	32.5																																																
2000g	34.0	33.0	32.5	32.0	32.0	32.0	32.0																																																
2500g	33.5	32.5	32.0	31.0	31.0	31.0	31.0																																																
3000g	33.0	32.0	31.0	30.0	30.0	30.0	30.0																																																

2.2 SAFE OXYGEN THERAPY

WHICH BABY NEEDS OXYGEN?

Start oxygen in the following circumstances

- Severe hypothermia
- Saturation < 90%
- Respiratory failure
- Circulatory failure
- Baby with SEVERE RESPIRATORY DISTRESS:
 - Oxygen saturation less than 90%
 - RR >80 breathes per minute
 - Severe chest in-drawing or grunting
 - Central cyanosis (blue tongue and lips)




CONCENTRATION OF OXYGEN

- The concentration of oxygen in room air is 21%, and the concentration of pure oxygen is 100%
- Too much or too little oxygen is bad for the baby. Keep oxygen saturation between 90 and 95%. Do this by mixing oxygen with air as below;
- An air / oxygen blender that mixes pure oxygen with medical air to give the required concentration (between 21% and 100%)

GUIDELINES FOR OXYGEN ADMINISTRATION

- A baby's O₂ saturation should be between 90% and 95%
- Start Nasal Prong Oxygen at 1L/min for babies with RESPIRATORY DISTRESS, and check saturation
- Monitor the oxygen saturation with a PULSE OXIMETER continuously for 30 minutes after starting the oxygen, and then once stabilised at least hourly. Maintain the saturation between 90 and 95%
- A baby's oxygen saturation should be between 90% and 95% if receiving oxygen. If the baby remains distressed, blue or the oxygen saturation is below 90% then increase the flow
- If the baby is preterm and the saturation is low and the baby has Severe Respiratory Distress, AND if CPAP is available then start Nasal CPAP
- If the baby does not cope on this then the baby will need to be transferred for ventilation, discuss with your NNU
- When the baby is comfortable on Nasal prongs and oxygen saturation is > 90% then remove nasal prongs, and monitor saturation in next 3 hours
- NEVER accept saturation > 97% when the baby is on oxygen, since it may cause retinal damage (ROP).

2.2 SAFE OXYGEN THERAPY: TO BABIES WHO ARE BREATHING SPONTANEOUSLY

	INDICATION	METHOD	FLOW AND CONCENTRATION	OBSERVATIONS	ADVANTAGES	DISADVANTAGES
NASAL PRONGS - NEONATE 	<ul style="list-style-type: none"> Respiratory distress No nasogastric tube in situ - baby may have an oro-gastric tube 	<ul style="list-style-type: none"> Place the prongs just below the baby's nostrils. Use 1mm prongs for small babies and 2mm prongs for term babies Secure the prongs with tape Humidification is not necessary 	<ul style="list-style-type: none"> 1 L per minute O₂ Concentration ~30% 	<ul style="list-style-type: none"> Monitor the oxygen saturation 3 hourly 	<ul style="list-style-type: none"> Ensures constant O₂ concentration Baby can be fed orally (cup or breast) Ideal for babies with mild respiratory distress 	<ul style="list-style-type: none"> Not for babies with severe breathing difficulty Not for babies with apnoea Prongs can get displaced
HEAD BOX (HBO2) 	<ul style="list-style-type: none"> Awaiting transfer to NNU and no one available to intubate the baby For babies not maintaining oxygen saturation on nasal prongs or cannula, and CPAP is not available 	<ul style="list-style-type: none"> Always ensure that the head stays within the head box Start with all the holes closed 4 – 10 L / min of oxygen is required Apply a face mask if you need to remove the baby from the head box Humidification is not necessary 	<ul style="list-style-type: none"> Start with 4 L / min oxygen and increase if needed Oxygen concentrations of 25% - 80% can be achieved 	<ul style="list-style-type: none"> Observe and record the oxygen saturation and colour hourly 	<ul style="list-style-type: none"> Does not obstruct the nasal passages 	<ul style="list-style-type: none"> Baby cannot be moved without supplemental O₂ Must feed by nasogastric tube High flow of oxygen needed to reach required concentration
CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) 	<ul style="list-style-type: none"> For preterm babies with severe respiratory distress, e.g. hyaline membrane disease. Apnoea of prematurity For term babies with severe respiratory distress due to TTN, pneumonia, atelectasis, pulmonary oedema. 	<ul style="list-style-type: none"> Apply special nasal prongs to the baby Connect the CPAP machine Connect the humidification circuit Start with a pressure of 5cm of water 	<ul style="list-style-type: none"> Oxygen and medical air are mixed through a blender, adjust FIO₂ according to saturation 	<ul style="list-style-type: none"> Observe and record the oxygen saturation continuously 	<ul style="list-style-type: none"> Delivers oxygen and provides a positive airway pressure to recruit alveoli and to prevent collapse of airways Decreases the work of breathing Optimises surfactant production. Reduces the incidence of apnoea. 	<ul style="list-style-type: none"> Give feeds via an orogastric tube Danger is gastric distension and vomiting Risk of air leak syndromes Reduction in cardiac output Trauma to the nostrils and skin

2.2 SAFE OXYGEN THERAPY: GUIDE FOR CPAP

GUIDE FOR CPAP

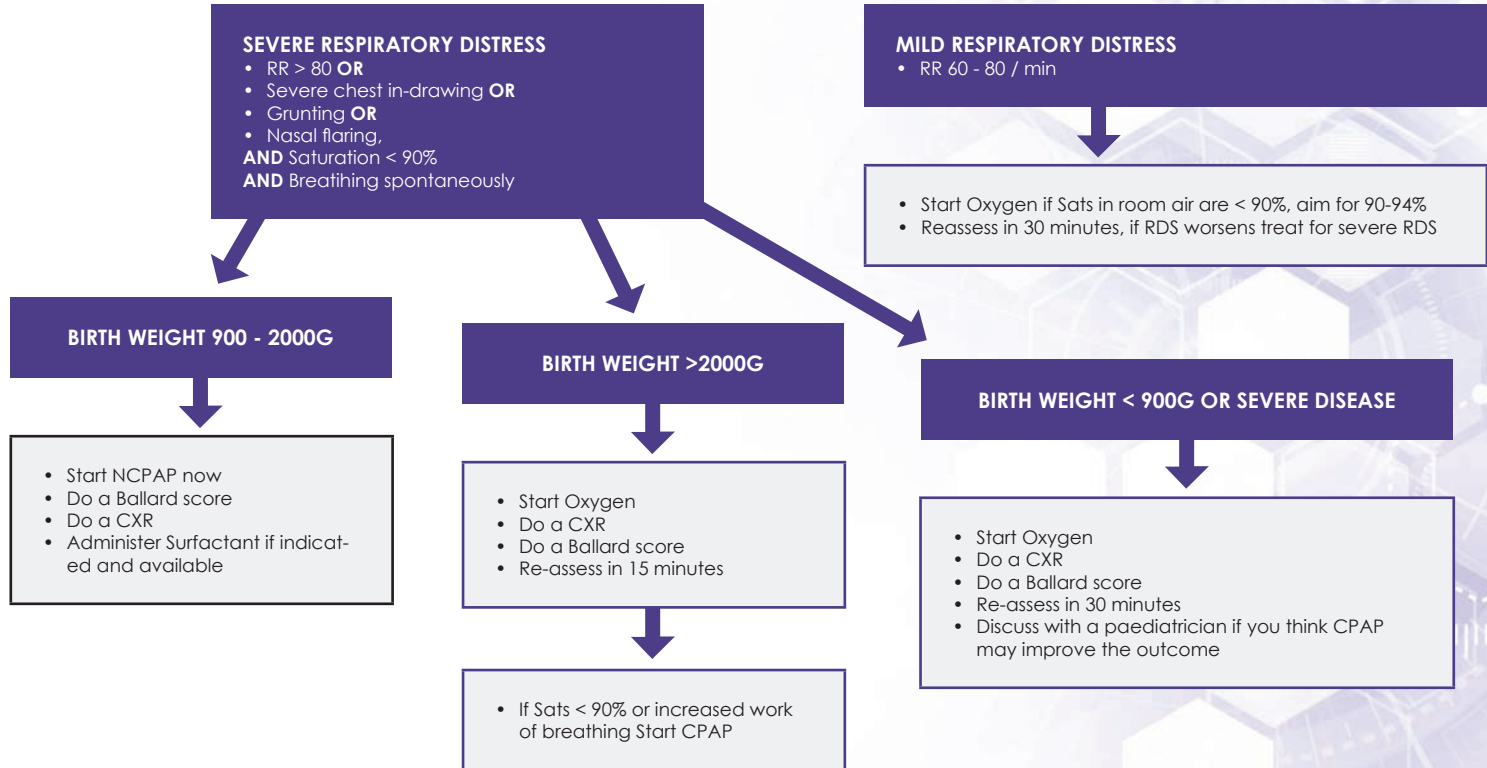
- Start on pressures of 5 cm H₂O
- Baby may need higher pressure based on RR and work of breathing.
- Utilise chest X-ray to assess lung expansion (7 - 8 posterior ribs visible above the diaphragm)
- Assess FiO₂ and oxygen saturation
- Weaning:
 - Reduce the oxygen by 5% if the O₂ saturation is > 95%
 - Reduce the pressure by 1cm of H₂O per hour until it is at 5cm of H₂O
- Change to nasal prong oxygen
 - When the FiO₂ is stable at less than 30% oxygen
 - AND when the pressure is at 4cm water
 - AND there are no apnoeic episodes
- The baby requires referral and transfer for ventilation if CPAP is adequate and applied at 8cm pressure for 1 hour and:
 - If the oxygen requirement is still > 40%, the respiratory rate is still > 60, or there are signs of severe respiratory distress
 - There is repeated apnoea on CPAP

CPAP IS NOT ADVISABLE WITH THE FOLLOWING

- Birth asphyxia
- Upper airway abnormalities, e.g. choanal atresia, tracheo-oesophageal fistula, cleft palate
- Severe cardio-respiratory instability
- Unstable respiratory drive with severe apnoea and / or bradycardia
- Abdominal distension
- If the oxygen saturation is worsening, consider intubation and referral for mechanical ventilation

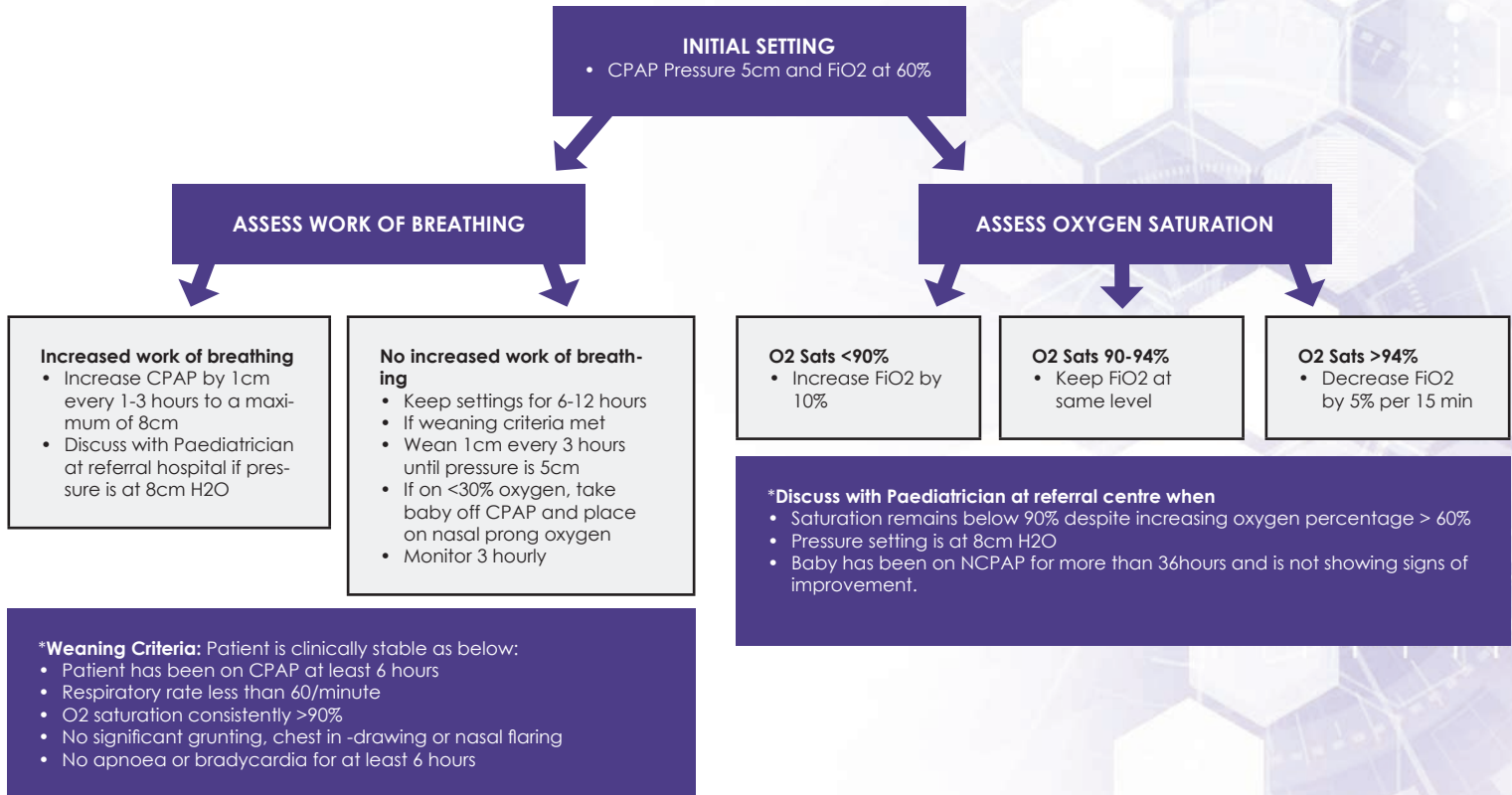
2.2 SAFE OXYGEN THERAPY: GUIDE FOR CPAP (continued)

WHICH BABIES TO PUT ON NASAL CPAP



2.2 SAFE OXYGEN THERAPY: GUIDE FOR CPAP (continued)

MANAGE BABY ON NCPAP



2.3 MAINTAIN NORMAL GLUCOSE

CHECK THE BLOOD GLUCOSE OF THE FOLLOWING BABIES

- Small (Preterm and Small for Gestational Age) and sick babies every 3 hours for the first 24 hours and until normal for 24 hours
- Babies of diabetic mothers hourly for the first 12 hours of life
- Babies who are hypothermic
- Babies who have not been fed
- Babies who have had birth asphyxia

CLINICAL SIGNS OF HYPOGLYCAEMIA

The baby may be asymptomatic or have the following priority signs: irregular jerky movements, jittery, convulsion, lethargy, coma, apnoea, hypotonia.

HYPOGLYCAEMIA

If the blood glucose is 1.4 - 2.5mmol/L

- Breastfeed or feed expressed breast milk. Only if breastfeeding is not possible (mother very sick or HIV-positive and has chosen not to breastfeed) then give 10ml/kg appropriate replacement milk feed
- Repeat the blood glucose in 15 minutes
- If the blood sugar remains low, treat for severe hypoglycaemia
- If the blood glucose is normal, give normal milk feeds and check the blood glucose 2- 3 hourly

If a baby has a persistent or recurrent hypoglycaemia check that the baby is in a thermo-neutral environment, is getting adequate feeds, and that he does not have sepsis.

BABY OF A DIABETIC MOTHER AND A LARGE FOR GESTATIONAL AGE BABY > 4.5kg

- Feed the baby immediately, or start IV Neonatalyte if the baby is nil per mouth
- Check the blood glucose hourly for 6 hours, then 2 hourly until 12 hours of age, stop when normal for 6 hours.
- If hypoglycaemia occurs, manage as above.

PREVENT HYPOGLYCAEMIA

- Put the baby to the breast immediately after birth
- If the baby is not sucking, pass a nasogastric tube and give a feed, or cup feed
- If milk feeds are contraindicated start intravenous fluids (Neonatalyte) immediately
- Keep the baby warm

TREAT HYPOGLYCAEMIA

SEVERE HYPOGLYCAEMIA

If the blood glucose is <1.4 mmol/L or hypoglycaemia with clinical signs

- Give a bolus of 10% dextrose (Neonatalyte) at 2 ml/kg. Then continue with the 10% dextrose at the recommended rate for age and weight (**pg.34-35**)
- Repeat the blood glucose in 15 minutes
- If still low increase infusion to 15% dextrose via a UVC. (Add 20ml of 50% dextrose to 200ml Neonatalyte)
- If the hypoglycaemia persists, then discuss with a paediatrician or neonatologist whether to administer glucagon IM/, IV/ SC dose: 0.2mg/kg/dose and for possible referral

HYPERGLYCAEMIA

- Hyperglycaemia is common in small, sick and septic babies.
- Check the hydration, and correct if dehydrated
- If on a 10% dextrose IV infusion, then change to 5% dextrose infusion
- If blood glucose remains > 14 mmol/L consult a paediatrician or neonatologist.
- NEVER give insulin, unless under the direction of a neonatologist.
- NEVER drop glucose intake below 30 ml/kg of glucose 10% (60/5%)

2.4 FEEDS AND FLUIDS FOR SICK AND SMALL BABIES

FOR BABIES < 1.5 KG OR SICK BABIES

- Commence on IV fluids and keep nil by mouth, until the baby is stable
- Consider giving 1ml of colostrum 3 hourly from birth (pg.35)
- Calculate the IV fluid and feed requirements for each baby using table 2 OR if a quick guide is needed in the absence of an experienced health worker use Table 2 or 3 (pg.35-36)
- Use birth weight to calculate feeds and fluids until baby has regained birth weight, then use the daily weight
- Gradually introduce expressed breast milk (EBM) by nasogastric tube from day 2
- Feed babies every 3 hours if they can tolerate this
- Increase the feeds daily if there is no vomiting, apnoea or abdominal distension
- If the baby does not tolerate 3 hourly feeds, then feed every 1 or 2 hours. Calculate the volume to be given every 1 or 2 hours
- Progress to cup feeding as soon as the baby can swallow and is well enough to sit up.
- Breastfeed the baby instead of giving EBM as soon as the baby can suckle
- **Of note:** ELBW and VLBW babies do have increased evaporative water loss and therefore have a higher fluid requirement.

FOR BABIES > 1.5 kg AND THOSE THAT CAN TAKE ORAL FEEDS BUT CANNOT SUCKLE

Feed 3 hourly by nasogastric tube according to suggested volumes in Table 2 and 3 (pg.35-36)

FEEDING METHOD

Tube feeding

- Babies who cannot suckle - usually gestational age <34 weeks
- Babies with severe respiratory distress
- Babies < 1.0 kg until there is appropriate weight gain

Cup feeding (pg.11)

- Babies who cannot breastfeed
- Cannot yet suckle but can swallow
- Babies less than 1,5kg

BABIES TO BE KEPT NIL BY MOUTH:

- Any baby when not stable
- A baby with a distended abdomen and vomiting
- A baby with neonatal encephalopathy, until bowel sounds heard

To calculate feeds, use birth weight until the baby has regained birth weight and thereafter use the weight on that day

- To calculate the drip rate in ml/hour: $\frac{\text{weight} \times \text{volume} / \text{kg}}{24} = \text{ml} / \text{hour}$
- Use a syringe driver or infusion pump when administering IV fluids to babies
- Feeds and fluids must be calculated and prescribed EVERY DAY

Suggested IV fluid

- Neonatalyte / NEOLYTE (contains 10% dextrose)
- Use potassium free neonatalyte or 10 % dextrose for premature and asphyxiated babies, until they pass urine. To calculate 10% dextrose solution take 10ml of 50% glucose solution and add into 100ml of 5% glucose solution.

Calculate feeding: $\text{weight} \times \text{volume} / \text{kg} = \text{ml} / \text{feed}$

3 hourly	2 hourly	hourly
$\frac{\text{weight} \times \text{volume} / \text{kg}}{8}$	$\frac{\text{weight} \times \text{volume} / \text{kg}}{12}$	$\frac{\text{weight} \times \text{volume} / \text{kg}}{24}$

Suggested feeds

- Breastfeed baby as soon as suckling well
- Expressed breast milk (EBM)
 - Add a Breast milk fortifier to EBM for babies < 1,5 kg on full feeds (Add 1 scoop to 25ml of breast milk). Stop when on full breastfeeding
- If no EBM available from mom use banked breast milk or an appropriate formula
 - If <1.5 kg – a pre-term formula (e.g. NAN, or Similac Special Care)
 - If >1.5 kg – a newborn formula

2.4 FEEDS AND FLUIDS FOR SICK AND SMALL BABIES

TABLE 2: FLUIDS AND FEEDS FOR SICK AND VERY SMALL BABIES ON IV FLUIDS AND NASOGASTRIC OR CUP FEEDS (ML/KG/DAY)

DAY OF LIFE		1	2	3	4	5	6+
< 1.0 KG	Total	100	100	100	125	150	175
	Oral	Start with colostrum on day 1, start feeds at 25 ml/kg when stable, daily increment 25 ml/kg					
1.0 – 1.5 KG	Total	80	80	100	125	150	150
	Oral	Start with colostrum on day 1, start feeds at 25 ml/kg when stable, daily increment 25 ml/kg					
>1.5 KG	Total	60	80	100	125	150	150
	Oral	Start feeds at 30 ml/kg when stable, daily increment of 30 ml/kg					

TABLE 3: AMOUNT (ml) OF 3 HOURLY CUP OR NASOGASTRIC FEEDS FOR BABIES ON ORAL FEEDS ONLY BUT WHO ARE NOT ABLE TO BREASTFEED

DAY OF LIFE	1	2	3	4	5	IF NOT GAINING
Fluid volume/ day	60ml/kg	75ml/kg	100ml/kg	125ml/kg	150ml/kg	180ml/kg
1.5 - <1.75 kg	12	15	20	25	30	35
1.75 - <2.5 kg	15	20	25	30	35	45
2.5 - <3.5 kg	25	30	35	50	55	70
3.5 - <4.5kg	30	35	50	60	75	90

In infants with a birth weight < 1.5 kg fluids and feeds should be prescribed according to table 2 and 3.

2.5 INFECTION PREVENTION AND CONTROL

Infection is common in newborns because of their immature immune system. Failure to follow infection prevention routines will result in hospital acquired infections and deaths.

GENERAL REMARKS

- Infection prevention guidelines and policies have to be developed in all units
- Basic measures as proper hand washing and clean working environment are the most important to prevent spread of infections
- Neonatal facilities should be designed according to the standards given in the Newborn Care Toolkit. **SPECIFICALLY** in relation to space per bed (High Care 7.2 m², and Standard In-patient Care 6m²) and room temperature (between 24-26°C).
- Staffing norms according to the Newborn Care Toolkit. Neonatal staff should be rotated as little as possible.
- Staffing norms in NNU to be adhered to prevent each staff member touching many babies
- Outbreaks should be referred to, and be controlled by, infection control teams
- All new staff members should be trained in infection control practices.
- A waste management policy has to be in place

HAND WASHING

- For infection control, proper hand hygiene before and after patient contact is the most important measure.
- To wash hands: remove watch, rings, bracelets and roll sleeves above elbow, wet hands thoroughly, apply chlorhexidine containing soap or solution and wash for 60 seconds, rinse under running water and dry using a clean disposable hand towel
- Always wash your hands on entering the nursery and before and after touching a baby, or after handling soiled linen or instruments
- Instruct mothers and visitors to wash their hands before and after touching their babies while in the neonatal unit
- An alcohol based hand lotion may be used instead of hand washing before and after handling babies.
- Each incubator or cot must have a bottle of alcohol containing hand lotion
- Each cubicle needs a basin with running water and chlorhexidine containing solution or soap, paper hand towels and a pedal bin

NURSING

- Newborn babies should ideally all receive breastmilk. Exclusively feeding with breast milk is best.
- Nurse the baby in skin-to-skin / Kangaroo Mother Care whenever possible.
- Each baby should remain in their own cot/incubator (only one baby per incubator)
- Each cot or incubator to have its own thermometer, stethoscope, and alcohol hand lotion and swabs. If not possible, cleanse with alcohol swab between each patient.
- Avoid having too many people handling the baby. Staff should be patient allocated, not task allocated
- Avoid overcrowding and understaffing in the neonatal unit
- Avoid communal activities like bathing
- Do any procedures in the cot/incubator
- Wear gloves for contact with the mucous membranes or body fluids
- Always use a separate pair of gloves for each baby
- Use alcohol hand lotion on the hands before and after handling the baby

2.5 INFECTION PREVENTION AND CONTROL

Infection is common in newborns because of their immature immune system. Failure to follow infection prevention routines will result in hospital acquired infections and deaths.

ISOLATION AND ADMISSION POLICIES IN THE NEONATAL UNIT

- Isolation of infected babies is usually not needed if a policy of adequate hand washing is practiced. Babies with gastroenteritis should be nursed in a private room
- Out-born babies should be admitted in the nursery; they do not necessarily spread infection to the babies born in the hospital
- **Neonates should be admitted to a Neonatal Unit and not to a paediatric ward, unless there is a neonatal section with its own staff**

CLEANING EQUIPMENT

- Wipe stethoscopes with alcohol swabs or 0.5% chlorhexidine and 70% alcohol between use
- Clean laryngoscopes with 70% alcohol after use
- Clean cellphones with alcohol swabs or 0.5% chlorhexidine and 70% alcohol at least once daily
- Cleanse hands after handling cellphones
- Clean incubators with 0.5% chlorhexidine between use and every week and allow to dry before using
- Remove and destroy sharps container when 2/3 full
- Clean spills of blood with 0.5% chlorhexidine
- Clean containers used to express breast milk with soap and water, then soak in 2% hypochlorite or autoclave.
- Clean oxygen tubing, and respirator circuits with soap and water then soak in 4% Chlorhexidine gluconate for 30 minutes, then rinse with clean water
- Soak in 5ml 10% isopropyl alcohol mixed with a bucket of water for another 30 minutes, then rinse with tap water.
- Using gloves, remove the tubing, drain the water, hang on a IV stand and then blow dry with oxygen

CLEANING WARD

- Clean floors twice a day with detergent, use separate mops for the neonatal ward
- High dusting must be performed with a clean damp duster
- Walls must be damp-wiped, or spot cleaned as needed, at least weekly
- Clean windows as needed

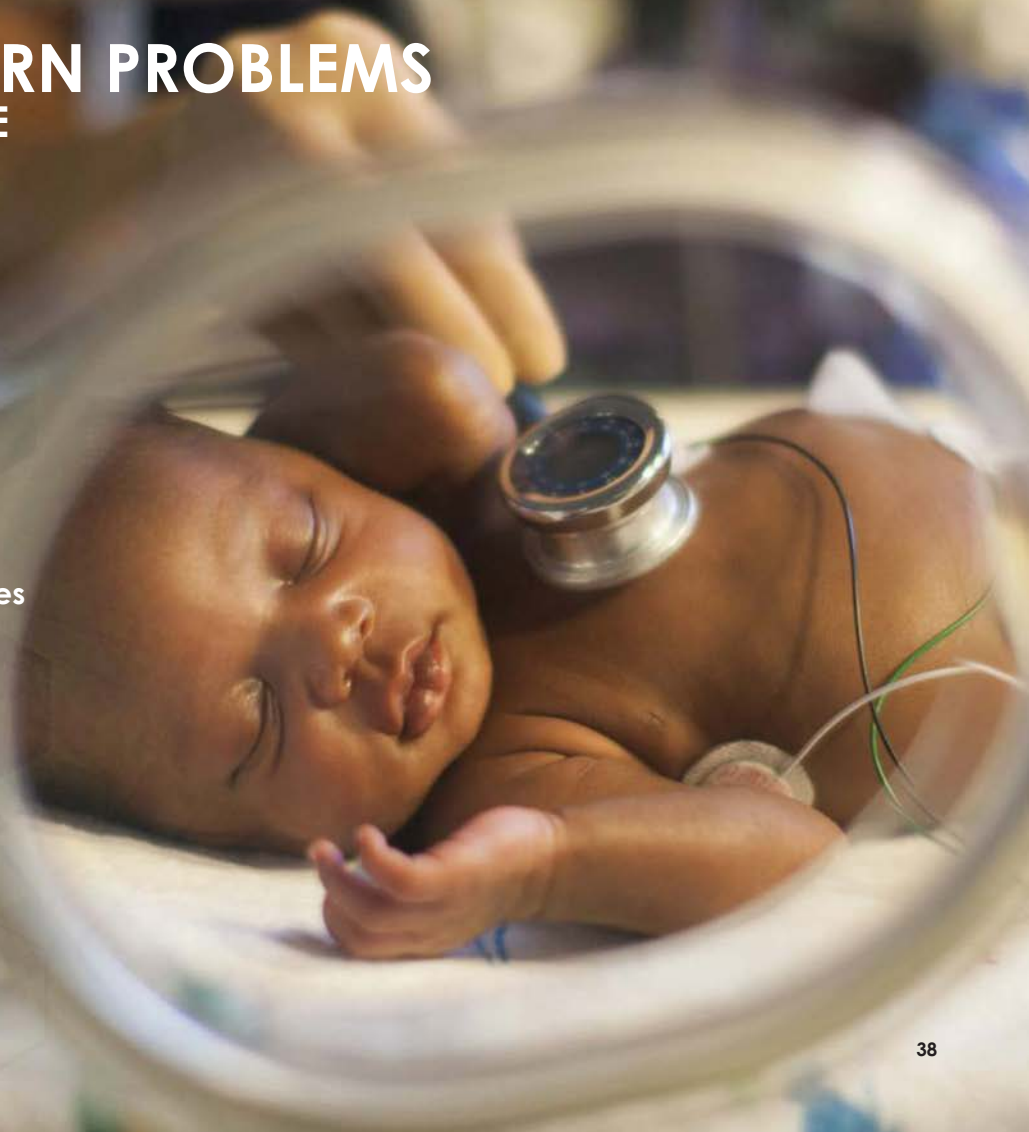
STAFF

- Exclude staff or visitors with a respiratory infection, fever blisters ("cold sores") or open skin lesions from the unit until they have recovered
- Ensure that staff working in the nursery are up to date with all routine immunisations and encourage them to have annual influenza immunisation
- Clothing:
 - Protective clothing is not needed.
 - Remove long sleeved clothing before entering
 - Remove white coats

SPECIFIC NEWBORN PROBLEMS

TREAT, OBSERVE AND CARE

- 3.1 Apnoea
- 3.2 Respiratory distress
- 3.3 Preterm and low birth weight
- 3.4 Serious acute infection
- 3.5 Neonatal encephalopathy
- 3.6 Neonatal seizures
- 3.7 Neonatal jaundice
- 3.8 Congenital abnormalities
- 3.9 Syphilis
- 3.10 Tuberculosis
- 3.11 HIV affected mothers and babies
- 3.12 Care of HIV infected babies



3.1 APNOEA

Apnoea is when a baby stops breathing for 20 seconds or more OR when it results in bradycardia and / or desaturation.

ACT NOW: Stimulate the baby by rubbing his / her back for 10 seconds: if the baby does not begin to breathe immediately, resuscitate the baby using a bag and mask.

PRETERM BABY:

For all preterm babies with apnoea and all babies < 1500g

- Load with oral caffeine 10 – 12,5 mg / kg and then 2,5 – 5mg/kg daily OR oral theophylline 5mg/kg loading dose followed by 2mg/kg 12 hourly
- Observe the baby for apnoea
- Once stabilised, KMC can be continued or started
- If there are intermittent apnoeic episodes, look for causes, and treat for sepsis.
- If there is persistent apnoea, assess for CPAP and discuss for transfer

TERM BABY:

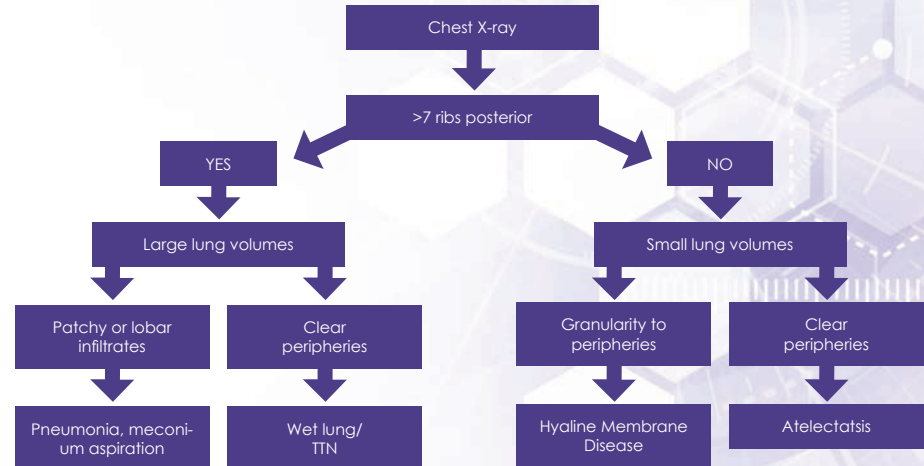
- Apnoea is unusual in term babies. Observe, investigate and refer if necessary
- Is there a history of HIE, is the baby convulsive? Do an HIE-score
- Monitor for 24 hours using an apnoea monitor, or skin-to-skin care
- Investigate and treat for sepsis if there is a 2nd episode of apnoea
- If the baby is free from apnoea for 24 hours and the baby is feeding well and has no other reason for hospitalisation, then prepare for discharge

3.2 RESPIRATORY DISTRESS

IDENTIFY THE CAUSE OF THE RESPIRATORY DISTRESS

- What is the gestational age of the baby
- Is the baby premature?
 - Can you do a shake test to confirm surfactant deficiency?
 - Is there an increased work of breathing?
- Is the baby term or post term?
- Was the baby resuscitated at birth?
- Was there a history of prolonged rupture of membranes?
- Was there meconium stained liquor?
- Do a Mobile CXR
 - Decide on the size of the lung volume
 - If the lung volume is small (< 7 ribs posteriorly)
 - Granular appearance to the periphery
 - Peripheries clear
 - Lung volumes are large (> 7 ribs posteriorly)
 - Patchy infiltrates throughout
 - Peripheries clear
- Free air in the pleural cavity – pneumothorax
- Free bowel in pleural cavity – diaphragmatic hernia

APPROACH TO READING A CXR IN A NEONATE



3.2 RESPIRATORY DISTRESS (continued)

TABLE 4: SPECIFIC TREATMENT FOR RESPIRATORY DISTRESS

FEATURES	INDICATIONS	METHOD
<ul style="list-style-type: none"> Severe respiratory distress with severe substernal in-drawing Preterm; gestational age <32 weeks Shake test: No bubbles or incomplete ring on the surface CXR: small lung volumes, granular opacities extend to the periphery of the lung fields 	RESPIRATORY DISTRESS SYNDROME	<ul style="list-style-type: none"> Start CPAP at 5 cm H₂O if possible Safe oxygen therapy (pg.29-32) and supportive care Surfactant in the first 12 hours under paediatric supervision Penicillin G/ ampicillin and gentamycin for 48 – 72 hours, then review, if infection is confirmed or strongly suspected continue for 7days. *
<ul style="list-style-type: none"> Born at or before term, often by Caesarean Section or precipitous labour Respiratory distress, mild, resolves in 72 hrs Overinflated chest clinically. CXR: large lung volumes, para-hilar streakiness, with clear peripheries 	WET LUNG	<ul style="list-style-type: none"> Safe oxygen therapy if needed (pg.29-32) Supportive care Start Penicillin G/ ampicillin and gentamycin, check FBC and CRP after 24 hours, if normal and the baby is well then stop antibiotics
<ul style="list-style-type: none"> Any gestational age History of prolonged rupture of membranes, chorioamnionitis or a congenital infection Develops respiratory distress after birth CXR: large lung volumes with patchy or lobar infiltrates 	PNEUMONIA	<ul style="list-style-type: none"> Oxygen guided by saturation monitor and supportive treatment Penicillin G / ampicillin and gentamycin for 7–10 days If the infection is hospital acquired or is not responding to first line antibiotics, consider resistant bacteria, fungal or, viral infection (Herpes Simplex (HSV) or Cytomegalovirus (CMV) and consult a paediatrician.
<ul style="list-style-type: none"> Term or post term History of meconium stained liquor CXR: large lung volumes, areas of consolidation 	MECONIUM ASPIRATION	<ul style="list-style-type: none"> Oxygen and supportive treatment (pg.29-32) Penicillin G/ ampicillin and gentamicin for 48 hours, then review CRP May need referral for ventilation
<ul style="list-style-type: none"> CXR: Free air in the pleural cavity 	PNEUMOTHORAX	<ul style="list-style-type: none"> Insert a chest drain Needle decompression if there is a tension pneumothorax
<ul style="list-style-type: none"> CXR: Bowel in the pleural cavity 	DIAPHRAGMATIC HERNIA	<ul style="list-style-type: none"> NGT on free drainage Supportive care Immediate referral to a tertiary centre DO NOT bag-mask ventilate the baby when in respiratory distress, but intubate.
Respiratory distress in a patient who also has <ul style="list-style-type: none"> Perinatal hypoxia Hypovolaemic / septic shock Hypothermia / hypoglycaemia / hyperthermia Anaemia Inborn error of metabolism 	METABOLIC CAUSES	<ul style="list-style-type: none"> Consider whether the respiratory distress may be due to metabolic acidosis or if one of the other causes of respiratory distress is also present Once the cause is treated the respiratory distress will resolve if the cause was metabolic
<ul style="list-style-type: none"> If the baby has a murmur, or remains cyanosed with no, or mild, respiratory distress, and there is no response to supplemental oxygen, suspect a cardiac problem 	CARDIAC	<ul style="list-style-type: none"> Refer to paediatrician for further evaluation

*Consider the antibiotic sensitivity profile or micro-organisms in a particular hospital or community when prescribing antibiotics
 CXR = Chest X-ray CRP = C-reactive protein FBC = Full blood count, LP = Lumbar puncture

3.3 PRETERM AND LOW BIRTH WEIGHT

Admit babies with a birth weight of less than 2 kg, or with a gestational age less than 35 weeks for observation and management.

TABLE 5: SPECIFIC TREATMENT FOR RESPIRATORY DISTRESS

	<1KG (ELBW)	1–1.5KG (VLBW)	1.5–2KG (LBW)	2–2.5KG (LBW)
Admission criteria	<ul style="list-style-type: none"> Admit all babies to high care 	<ul style="list-style-type: none"> Admit all babies to high care 	<ul style="list-style-type: none"> Admit babies for assessment in the neonatal unit Transfer to KMC once intermittent KMC is successful and other problems are resolving 	<ul style="list-style-type: none"> Can stay with the mother in the postnatal ward, or move to KMC if they need more monitoring Admit babies if they are not well
Warmth (See pg.25-27)	<ul style="list-style-type: none"> Use a servo-controlled incubator 	<ul style="list-style-type: none"> Servo-controlled incubator if ill Intermittent KMC when stable 	<ul style="list-style-type: none"> Incubator until stable Once stable, do continuous KMC 	<ul style="list-style-type: none"> Continuous KMC
Assessment	<ul style="list-style-type: none"> Ballard score 	<ul style="list-style-type: none"> Ballard score 	<ul style="list-style-type: none"> Ballard score 	<ul style="list-style-type: none"> Ballard score
Fluids and feeds (See pg.34-35)	<ul style="list-style-type: none"> Day 1: Establish IV line and give only IV fluids Day 2: Start EBM feeds 2 or 3 hourly via nasogastric tube when stable Day 3: calculate EBM and IV fluids according to table 3 (pg. 35) 	<ul style="list-style-type: none"> Establish an IV line and give only IV fluids for the first 24 hours, unless the baby has no respiratory or other problems Then start 3 hourly nasogastric tube feeding according to table 2 or 3 (pg.34-35) 	<ul style="list-style-type: none"> If the baby is able to suckle, breastfeed 3 hourly If the baby is unable to suckle, feed EBM via cup 3 hourly 	<ul style="list-style-type: none"> If the baby is able to suckle, breastfeed 3 hourly If the baby is unable to suckle, feed EBM via cup 3 hourly
Observations	<ul style="list-style-type: none"> Hourly respiratory and heart rates (RR, HR). Intake 3 hourly blood glucose for first 72 hours Hourly oxygen saturation Monitor output in ill patients 	<ul style="list-style-type: none"> 3 hourly RR, HR, Temperature, colour, activity Intake 3 hourly blood glucose for the first 24 hours 1-3 hourly oxygen saturation for babies on oxygen Monitor output in ill patients 	<ul style="list-style-type: none"> 6 hourly RR, HR, Temperature, colour and activity Intake 3 hourly blood glucose for the first 24 hours 1-3 hourly oxygen saturation for babies on oxygen Monitor output in ill patients 	<ul style="list-style-type: none"> 6 hourly RR, HR, Temperature, colour and activity Intake

3.3 PRETERM AND LOW BIRTH WEIGHT (continued)


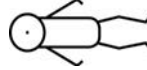
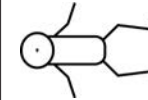
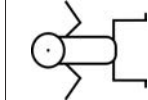
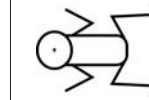




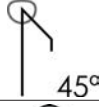
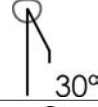
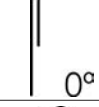









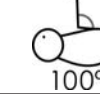

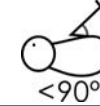




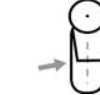

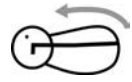
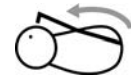
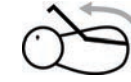



Fluid/feed volume and method	<ul style="list-style-type: none"> Follow fluid management guidelines on pg.35 for daily fluid volume increases Progress to cup feeding Progress to breastfeeding as soon as the baby can suckle
Apnoea prevention	<ul style="list-style-type: none"> <1.5kg or <35 weeks gestation: <ul style="list-style-type: none"> Caffeine 10 – 12.5 mg/ kg PO loading dose, and maintenance 5 – 10mg/kg/dose PO or if not available Oral theophylline: Load with 5mg / kg then 2mg / kg / dose 12 hourly Apnoea monitor for babies with a weight of <1.5kg Stop when the baby weighs 1.8kg or when baby is free of apnoea for 7days
Oxygen therapy	<ul style="list-style-type: none"> Babies with a respiratory rate >80, severe chest in-drawing, <u>OR</u> grunting, <u>AND</u> oxygen saturation less than 90%. Note: not all low birth weight babies will need oxygen
Antibiotics	<ul style="list-style-type: none"> Give antibiotics to the following groups of babies: <ul style="list-style-type: none"> Babies from a potentially infected environment, e.g. born to mothers with prolonged rupture of membranes Babies with obvious signs of infection Babies <37 weeks gestation where there is no obvious reason for the preterm labour Babies with respiratory distress Start IV penicillin G/ ampicillin <u>AND</u> gentamicin 5 mg/kg/day. For meningitis see pg.58 Do FBC and CRP after 24 hours and stop antibiotics if lab results are normal, the BC is still negative and the baby is clinically normal
HIV exposed infants	<ul style="list-style-type: none"> See management for HIV in preterm babies on pg.59-61
Vitamins	<ul style="list-style-type: none"> 0.6 ml of multivitamin drops (preparation must include 400iu Vitamin D) daily once the baby is on full feeds
Iron	<ul style="list-style-type: none"> 0.6 ml ferrous lactate (Ferro drops) daily once the baby is on full feeds and there is no evidence of infection
Measurement	<ul style="list-style-type: none"> Measure the following and chart on the baby record <ul style="list-style-type: none"> Daily weight. Assess the weight gain 2 x per week according to the chart on pg.48 Weekly head circumference. If the head is growing too quickly then refer Weekly haemoglobin. If the Hb is < 6 gr/dl, transfuse, perhaps earlier when there is inappropriate weight gain.
Discharge	<ul style="list-style-type: none"> Discharge when the baby's weight is between 1.8–2kg <u>AND</u> scores 20 or more on the KMC score sheet (pg.47) The baby must continue with multivitamin and iron for 6 months. Write this in the Road to Health Booklet Give immunisations, see pg.64
Follow up	<ul style="list-style-type: none"> Ensure that your hospital has a high risk follow up clinic to follow up babies until they are 9 months old. Babies with a birth weight <1.5kg and bigger babies with a complicated course must be followed up at a high risk clinic After discharge from KMC, follow up the baby in 3-5 days If the baby is gaining weight well, follow up every 2 weeks until the baby is 2.5kg. Thereafter the baby can be followed up at the clinic Babies with a birth weight <1.5kg, or who have had sepsis or hypoxic ischaemic encephalopathy need a neuro-developmental evaluation at 4 and 9 months Babies who are HIV exposed must have their HIV follow up site identified and documented, and a specific date given for their 10-week HIV PCR test, if the baby was on prolonged PMTCT this should be done at 18 weeks All relevant health information MUST be documented in the Road to Health Booklet If retinal eye examination services are available in your district, refer infants for retinal assessments who were < 1,5kg or < 32 weeks gestation and infants who received prolonged oxygen at 6 weeks corrected age

3.3 PRETERM AND LOW BIRTH WEIGHT: BALLARD SCORE

NEUROLOGICAL MATURITY:	(for instruction see: www.ballardscore.com) All 6 neurological features are assessed with the baby lying supine (the baby's back on the bed). The baby should be awake but not crying.													
POSTURE:	Handle the baby and observe the position of the arms and legs. More mature babies (with a higher gestational age) have better flexion (tone) of their limbs.													
SQUARE WINDOW:	Gently press on the back of the baby's hand to push towards the forearm. Observe the degree of flexion. More mature babies have greater wrist flexion.													
ARM RECOIL:	Fully bend the arm at elbow so that the baby's hand reaches the shoulder, and keep it flexed for 5 seconds. Then fully extend the arm by pulling on the fingers. Release the hand as soon as the arm is fully extended and observe the degree of flexion at the elbow (recoil). Arm recoil is better in more mature babies.													
POPLITEAL ANGLE:	With your one hand hold the baby's knee against the abdomen. With the index finger of the other hand gently push behind the baby's ankle to bring the foot towards the face. Observe the angle formed behind the knee by the upper and lower legs (the popliteal angle).													
SCARF SIGN:	Take the baby's hand and gently pull the arm across the front of the chest and around the neck like a scarf. With your other hand gently press on the baby's elbow to help the arm around the neck. In more mature babies the arm cannot be easily pulled across the chest.													
HEEL TO EAR:	Hold the baby's toes and gently pull the foot towards the ear. Allow the knee to slide down at the side of the abdomen. Unlike the illustration, the baby's pelvis may lift off the bed. Observe how close the heel can be pulled towards the ear.													
PHYSICAL MATURITY:	Six external features are examined. The baby has to be turned over to examine the amount of lanugo. If the baby is too sick to be turned over, then the amount of lanugo is not scored.													
SKIN:	Examine the skin over the front of the chest and abdomen, and also look at the limbs. More mature babies have thicker skin.													
LANUGO:	This is the fine, fluffy hair that is seen over the back of small babies. Except for very immature babies that have no lanugo, the amount of lanugo decreases with maturity.													
PLANTAR CREASES:	Use your thumbs to stretch the skin on the bottom of the baby's foot. Very fine wrinkles that disappear with stretching are not important. More mature babies have more creases.													
BREAST:	Both the appearance of the breast and the size of the breast bud are considered. Palpate for the breast bud by gently feeling under the nipple with your index finger and thumb. More mature babies have a bigger areola and breast bud.													
EAR:	Both the shape and thickness of the external ear are considered. With increasing maturity the edge of the ear curls in. In addition, the cartilage in the ear thickens with maturity so that the ear springs back into the normal position after it is folded against the baby's head.													
GENITALIA:	Male and female genitalia are scored differently. With maturity the testes descend in the male and the scrotum becomes wrinkled. In females the labia majora increase in size with maturity.													
SCORING:	Add up the scores from the physical and neurological features and use the table below to estimate the gestational age.													
	Score	-10	-5	0	5	10	15	20	25	30	35	40	45	50
	Weeks	20	22	24	26	28	30	32	34	36	38	40	42	44

3.3 PRETERM AND LOW BIRTH WEIGHT: BALLARD SCORE

NEUROMUSCULAR MATURITY

NEUROMUSCULAR MATURITY SIGN	SCORE							RECORD SCORE HERE
	-1	0	1	2	3	4	5	
POSTURE								
SQUARE WINDOW (WRIST)	 $>90^{\circ}$	 90°	 60°	 45°	 30°	 0°		
ARM RECOIL		 180°	 $140^{\circ}-180^{\circ}$	 $110^{\circ}-140^{\circ}$	 $90^{\circ}-110^{\circ}$	 $<90^{\circ}$		
POPLITEAL ANGLE	 180°	 160°	 140°	 120°	 100°	 90°	 $<90^{\circ}$	
SCARF SIGN								
HEEL TO EAR								
							TOTAL NEUROMUSCULAR MATURITY SCORE	







3.3 PRETERM AND LOW BIRTH WEIGHT: BALLARD SCORE

PHYSICAL MATURITY

PHYSICAL MATURITY SIGN	SCORE								RECORD SCORE HERE
	-2	-1	0	1	2	3	4	5	
SKIN		Sticky, friable, transparent	Gelatinous, red, translucent	Smooth pink, visible veins	Superficial peeling and/or rash, few veins	Cracking, pale areas, rare veins	Parchment, deep cracking, no vessels	Leathery, cracked, wrinkled	
LANUGO		None	Sparse	Abundant	Thinning	Bald areas	Mostly bald		
PLANTAR SURFACE	Heel-toe <40 mm	Heel-toe 40-50 mm	>50 mm no crease	Faint red marks	Anterior transverse crease only	Creases ant. 2/3	Creases over entire sole		
BREAST		Imperceptible	Barely perceptible	Flat areola no bud	Stippled areola 1-2 mm bud	Raised areola 3-4 mm bud	Full areola 5-10mm bud		
EYE / EAR	Lids fused tightly	Lids fused loosely	Lids open pinna flat stays folded	Slightly curved pinna; soft; slow recoil	Well-curved pinna; soft but ready recoil	Formed & firm instant recoil	Thick cartilage ear stiff		
GENITALS (MALE)		Scrotum flat, smooth	Scrotum empty, faint rugae	Testes in upper canal, rare rugae	Testes descending, few rugae	Testes down, good rugae	Testes pendulous, deep rugae		
GENITALS (FEMALE)		Clitoris prominent and labia flat	Prominent clitoris & small labia minora	Prominent clitoris & enlarging minora	Majora & minora equally prominent	Majora large, minora small	Majora cover clitoris & minora		
								TOTAL PHYSICAL MATURITY SCORE	

3.3 KANGAROO MOTHER CARE (KMC)

KMC is a means of providing the small baby with warmth and nutrition by continuous skin-to-skin contact on the mother's chest.

<p>WHEN TO START KMC IN A BABY</p>	<ul style="list-style-type: none"> • Intermittent skin-to-skin contact is commenced when the baby is in Neonatal Unit and stable enough to come out of the incubator for periods of time • Continuous KMC is commenced when the baby is stable enough to stay continuously with the mother in the KMC position. This is usually when the baby no longer has respiratory distress, apnoea or instability. • 1.5kg is a safe guide, but will vary according to the gestation, the condition of the baby, and how care is organised in your NNU 	
<p>HOW TO POSITION THE BABY IN KMC</p>	<ul style="list-style-type: none"> • Dress the baby in a nappy and cap • Place the baby in an upright position against the mother's bare chest, between her breasts and inside her blouse • Cover both mother and baby with a blanket or jacket if the room is cold • You may use a special garment; or tuck the mother's blouse under the baby or into her waistband • The baby must be secure enough so that the mother can walk around without holding her baby 	
<p>FEEDING BABY WHILE IN KMC</p>	<ul style="list-style-type: none"> • Babies who are unable to suckle should be fed expressed breast milk via a nasogastric tube or cup. Babies may be kept in the KMC position while tube feeding. Allow them to try suckling during the tube feed • Babies will show that they are ready to suckle as their rooting and suckling reflexes develop • Once the baby is able to suckle, allow the baby to breastfeed on demand, and feed at least every three hours • Mothers who for medical reasons are using formula can still provide KMC and cup feed the baby 	
<p>CARE AND MONITORING IN KMC</p>	<ul style="list-style-type: none"> • While in KMC the baby will still require observation, and treatment. This can include nasal oxygen in a baby who has chronic lung disease, but best not in the acute period, except for periods of intermittent KMC. • Monitor 6 hourly heart rate, respiratory rate, temperature, activity and colour, as well as intake and output • Daily weight, weekly head circumference, weekly haemoglobin, all plotted in Neonatal Record • Evaluate the mother and baby once a day by using the KMC score sheet (pg.47) 	
<p>CARE IN THE KMC WARD</p>	<ul style="list-style-type: none"> • The KMC ward should be warm and inviting • The mother must keep her baby in KMC position at all times (except while she does her ablutions) • Good hygiene is important, including hand washing after using the toilet and before feeding • Mothers can walk around the ward, and outside with their babies in the KMC position if the weather conditions are favourable • Occupy the mothers and encourage appropriate developmental stimulation • Allow the father and grandmother, and other appropriate people, to nurse the baby in the KMC position when they come to visit 	
<p>KMC DISCHARGE</p>	<ul style="list-style-type: none"> • A baby who is in the KMC ward can be discharged when the baby has reached 1.8kg, and has a KMC score of at least 20 • Don't discharge babies too early. It can be difficult to come back quickly if the baby has a problem • Follow usual procedures on pg.64, and be sure that they bring the baby back within a few days to check that he / she is growing 	

3.3 PRETERM AND LOW BIRTH WEIGHT: KMC SCORE CHART

KMC Daily Score Sheet Based on the Intra-hospital KMC Training Programme in Bogota, Colombia				Date of birth/...../.....															
				Date →															
Name:		Breastfeeding:		Date started 24 hour KMC/...../.....	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	
Hospital No:		Formula:	/...../.....															
Evaluation	Score			Weight →															
	0	1	2	Remarks															
Socio-economic support	No help or support	Occasional help	Good support system																
Mother's milk production	Expresses 0 -10ml breast milk	Expresses 10 - 20 ml breast milk	Expresses 20 - 30 ml breast milk	Must score before discharge. N/A for formula															
Positioning and attaching of baby onto breast	Always need assistance	Occasionally needs assistance	No assistance needed	Not applicable for formula feeding															
Baby's ability to suckle at the breast/ cup feed	Gets tired very quickly	Gets tired infrequently	Takes all feeding well																
Confidence in handling baby, e.g. feeding, bathing, changing	Always need assistance	Occasionally needs assistance	No assistance needed																
Baby's weight gain per day	0-10g	10-20g	20-30g	Must score 1 or 2 before discharge															
Confidence in administering vitamin and iron drops	No confidence	Some confidence	Fully confident																
Knowledge of KMC	No knowledge	Some knowledge	Knowledge-able																
Acceptance & application of KMC	Does not accept or apply KMC	Partly accepts & applies KMC method	Applies KMC without having to be told	Applies KMC without having to be told															
Confidence in caring for baby at home	Does not feel sure or able	Feels slightly unsure and unable	Feels confident																
TOTAL SCORE PER DAY																			

3.3 ASSESS FEEDING AND WEIGHT GAIN IN LOW BIRTH WEIGHT BABIES

Use this chart once or twice a week until discharge to evaluate weight gain in low birth weight babies.

- Before discharging babies evaluate breastfeeding (pg.10) or replacement feeding (pg.11-12) in low birth weight babies.
- Use this chart to evaluate weight gain after discharge.

ASK, CHECK, RECORD	LOOK, LISTEN, FEEL	SIGNS	CLASSIFY	TREAT AND ADVISE
<ul style="list-style-type: none"> • Weigh daily and record weight • Plot daily weight on the graph • Calculate weekly weight gain Assess weight gain <ul style="list-style-type: none"> • If the baby is < 10 days <ul style="list-style-type: none"> ◦ Has the baby lost more than expected body weight? OR ◦ Has the baby regained birth weight at 10 days? OR ◦ Is the baby gaining sufficient weight? 	%Weight loss $\frac{\text{Birth weight} - \text{Current weight}}{\text{Birth weight}} \times 100$ Weight gain / kg / day $\frac{\text{Current weight (g)} - \text{Previous wt. (g)}}{\text{Previous weight in kg} \times \text{no. days}}$	<ul style="list-style-type: none"> • More than 10% weight lost in first week • Weight gain insufficient 	INADEQUATE WEIGHT GAIN	<ul style="list-style-type: none"> • Determine the cause of inadequate weight gain
		<ul style="list-style-type: none"> • Adequate weight gain or • Less than 10% weight loss in first week 	ADEQUATE WEIGHT GAIN	<ul style="list-style-type: none"> • Continue feeding • When able to suckle, start breastfeeding
		Expected weight loss <ul style="list-style-type: none"> • A 10% of weight loss in the first week is the maximum accepted Expected weight gain <ul style="list-style-type: none"> • Initial loss regained in 7 - 10 days • Thereafter minimum weight gain should be: Preterm = 10g / kg / day Term = 20g / kg / day 		

If INADEQUATE WEIGHT GAIN, determine the cause and classify for cause

Assess feeding <ul style="list-style-type: none"> • What feed volume is being given? (ml / kg / day) • How is the baby fed? (Cup / breast / nasogastric tube) • Is this appropriate for the baby's development or condition? Assess thermo-neutral environment <ul style="list-style-type: none"> • Is the baby maintaining a normal temp? • Is a small baby in an incubator adequately dressed? (woollen cap, booties, plastic wrap) • If in KMC, is this continuous? • Does the baby have an infection? 	Assess for priority signs <ul style="list-style-type: none"> • Lethargy • Less than normal movements 	<ul style="list-style-type: none"> • Baby seems unwell, lethargic, less than normal movement 	SERIOUS ILLNESS	<ul style="list-style-type: none"> • Investigate and treat for sepsis or specific infections
		<ul style="list-style-type: none"> • Inadequate feed volume for weight and age 	INSUFFICIENT FEEDS	<ul style="list-style-type: none"> • Correct the feed volume • Increase feeds by 20 ml / kg / day until 180 ml / kg / day of feeds (pg.34-35)
		<ul style="list-style-type: none"> • Baby < 1.8 kg is not getting continuous KMC • Baby < 1.5 kg is not adequately heated 	INADEQUATE TEMPERATURE CONTROL	<ul style="list-style-type: none"> • Correct the thermo-neutral environment (pg.25-27)
		<ul style="list-style-type: none"> • Preterm baby < 1.5 kg is suckling from breast • Baby < 1.5 kg is cup fed 	INCORRECT FEEDING METHOD	<ul style="list-style-type: none"> • Correct feeding (pg.34-35)
		<ul style="list-style-type: none"> • No problems identified 	CAUSE UNCLEAR	Consider other causes: <ul style="list-style-type: none"> • Anaemia • Hyponatraemia • PDA

3.4 SERIOUS ACUTE INFECTION

- If you think the baby may be septic, do a septic screen, FBC, CRP, Blood Culture, consider Urine MC&S, LP and CXR,
- Decide on the site of infection and commence treatment. Use the table below to assist with diagnosis, investigation and first line treatment
- If the baby has signs of sepsis, but the site of infection is not yet clear, treat for septicaemia
- The baby may also have congenital syphilis, refer to **pg.57** for treatment
- If convulsions are present, give a loading dose of phenobarbitone 20-40 mg/kg IM / IV slowly. Consider maintenance phenobarbitone 4mg/kg/day

SIGNS	CLASSIFICATION	INVESTIGATIONS	FIRST LINE SPECIFIC TREATMENT
<ul style="list-style-type: none"> • Lethargy, poor feeding, abdominal distension, pallor, jaundice, purpura, recurrent apnoea, hypothermia, oedema 	SEPTICAEMIA	Septic screen <ul style="list-style-type: none"> • Blood culture, FBC, CRP • Lumbar puncture • CXR • Urine MC&S 	Start empiric treatment with <ul style="list-style-type: none"> • Gentamicin, IV PLUS • Penicillin G / ampicillin IV • Duration depends on response to treatment If the child is deteriorating and there are no culture positive results, refer / consult for 2nd line empiric treatment <ul style="list-style-type: none"> • Consider fungal, anaerobic and viral infections • Nurse in high care or ICU based on severity • Refer if complications or poor response to treatment
<ul style="list-style-type: none"> • Apnoea • Convulsions • Bulging fontanelle • Lumbar puncture (LP) – pus cells 	MENINGITIS	Septic screen <ul style="list-style-type: none"> • Repeat LP after 48 – 72 hours to ensure response to therapy in case of Gram-negative bacteria or fungal disease • Do an ultrasound of the brain during the course of the illness 	<ul style="list-style-type: none"> • Cefotaxime IV for 21 days PLUS • Ampicillin IV for 14 days • Reconsider choice of antibiotics when the results of CSF and blood cultures become available or if baby does not improve within 72 – 96 hours • Refer if complications or not responding to treatment
<ul style="list-style-type: none"> • Term baby with prenatal hypoxia, or preterm baby • Signs of septicaemia or shock • Abdominal distension • Bile stained vomiting • Blood in the stool 	NECROTIZING ENTEROCOLITIS	Septic Screen <ul style="list-style-type: none"> • Abdominal X-ray <ul style="list-style-type: none"> ◦ Distended static loops of bowel ◦ Thickened bowel wall ◦ Air in bowel wall ◦ Perforation 	<ul style="list-style-type: none"> • Ampicillin IV PLUS gentamycin IV PLUS metronidazole IV for 7 days • If the infection is hospital acquired start second line antibiotics • Reassess choice of antibiotics when the culture and sensitivity become available • NG tube on free drainage • NPO for 72 hours, if NEC confirmed for 7 days • Refer all cases to a level 3 hospital
<ul style="list-style-type: none"> • History of unhygienic treatment of the cord • Difficulty with sucking and swallowing • Increased tone • Opisthotonos, spasms and sudden jerks following stimulation • Laryngeal spasm 	TETANUS	<ul style="list-style-type: none"> • Gram stain of stump may reveal Gram positive bacilli • LP to rule out meningitis • NOTIFY 	<ul style="list-style-type: none"> • Start Penicillin G 100.000U/kg iv for 5 days ASAP • Refer all cases to a level 3 hospital • Admit to high care/ICU to a quiet isolated cubicle • Human anti tetanus immunoglobulin IM 500 iu • Tetanus toxoid IM, 0,5ml into deltoid muscle • Phenobarbitone, oral 4mg/kg once daily • Chlorpromazine, oral, 1mg/kg/dose 8 hourly via NG

3.5 NEONATAL ENCEPHALOPATHY

If a term baby is less than 3 days old, and cannot suckle, and has a history of prolonged labour or an Apgar score < 8 treat for neonatal encephalopathy (NE)
Classify the severity of NE – score the baby using the scoring chart on **pg.51**.

CLASSIFY	COURSE/ PROGNOSIS	MANAGEMENT
Mild (HIE score <11) <ul style="list-style-type: none"> Increased tone Hyper-alert, jittery Poor feeding Normal breathing/ hyper-ventilation 	Features usually last for 24 - 48 hours and then resolve spontaneously	Classify the severity using the HIE score below Temperature <ul style="list-style-type: none"> Do not over-heat the baby, avoid hyperthermia. Keep the baby's temperature +/- 36°C If the baby has moderate or severe HIE and a bed for cooling is available within 6 hours of birth at a level 2 or 3 hospital, refer for cooling. Observations <ul style="list-style-type: none"> 1 - 3 hourly RR, HR, temperature, glucose, colour and activity, daily HIE score (pg.51) Fluids and feeds <ul style="list-style-type: none"> Establish an IV line and give only IV fluids for the first 12-24 hours, Do not use neonatalyte until the baby has passed urine, give D/W 10% instead (or, potassium-free neonatalyte) Restrict the fluid intake to 40 - 60 ml/ kg body weight for the first 3 days Monitor hydration Monitor urine output, consider a urine catheter: If the baby passes urine <6 times per day or produces no urine, do not increase the fluid volume on the next day Monitor U&E daily When the amount of urine begins to increase, increase the volume of fluid intake gradually, regardless of the baby's age – i.e. progress from 60ml/kg to 80ml/kg to 100ml/kg to 120ml/kg Start feeds once bowel sounds are present <ul style="list-style-type: none"> If the baby is unable to suckle, give the feeds by nasogastric tube When the baby is able to suckle adequately, start breast feeding Convulsions <ul style="list-style-type: none"> Give phenobarbitone 20 mg/ kg slowly IV or IM If convulsions continue, give another dose of phenobarbitone 10 mg/ kg IV slowly over 5 minutes, or IM Maintenance phenobarbitone oral 4mg/kg/day begin 12 – 24 hours after loading dose If the seizures continue, discuss management with a paediatrician. Taper and stop anticonvulsants, if there have been no convulsions for 2 weeks. Encourage the mother to hold and cuddle her baby <ul style="list-style-type: none"> Newborns with Severe HIE (score >15) should not be ventilated
Moderate (HIE score 11 – 14) <ul style="list-style-type: none"> Lethargy Occasional apnoea / convulsions Feeding difficulty 	It resolves within one week, but long term neuro-developmental problems are possible	
Severe (HIE score 15 or more) <ul style="list-style-type: none"> Floppy Unconscious Convulsions common Unable to feed Severe apnoea 	<p>The baby may or may not improve over several weeks.</p> <p>If the babies survive, permanent brain damage may occur (cerebral palsy or mental impairment)</p>	

3.5 NEONATAL ENCEPHALOPATHY: (HYPOXIA / ISCHAEMIA OF THE NEWBORN)

Ongoing care for babies with HYPOXIA / ISCHAEMIA

- If the baby's condition does not improve after 3 days: Reassess for signs of serious infection or severe disease (pg.20 and 49)
- If the baby's condition does not improve after 1 week: Keep baby in hospital until feeding well
- Discuss the baby's prognosis with the mother and/or family
- Follow up in 1 week. The baby must come sooner if he / she is not feeding well, or has convulsions, or is sick

HYPOXIC ISCHAEMIC ENCEPHALOPATHY (HIE) SCORING SYSTEM

- The HIE scoring system is a simple clinical tool which helps to predict the infant's long term outcome.
- This chart is easy to use. It consists of a clinical assessment of 9 signs, which need to be assessed daily, and a score recorded.
- Infants with a maximum score of 10 or less, will almost certainly be neurologically normal. Those with a maximum score of 15 or more, and who are not sucking by day 7, will probably not be neurologically normal. (Ref 3)

SCORE					DAY	1	2	3	4	5	6	7	8	9	10
Sign	0	1	2	3	Date										
Tone	normal	hyper	hypo	flaccid											
Conscious level	normal	hyperalert, stare	lethargic	comatose											
Fits	none	infrequent<3/day	frequent 3 or more/day												
Posture	normal	fisting, cycling	strong distal flexion	de-cerebrate											
Moro	normal	partial	absent												
Grasp	normal	poor	absent												
Suck	normal	poor	absent												
Respiration	normal	hyperventilation	brief apnoea	Apnoea											
Fontanelle	normal	full - not tense	tense												
Total score per day															
<11 mild HIE					11-14 moderate HIE					>14 severe HIE					

The score usually increases for the first few days after birth and then returns to normal by 1 week in mildly affected babies. A high score is generally associated with a high mortality, while a score that remains high beyond 1 week is associated with a high risk of abnormal neurological development.

3.6 NEONATAL SEIZURES

Neonatal seizures are usually secondary to an underlying brain injury or malformation or due to a biochemical disorder. Differentiate seizures from jitteriness by the fact that seizures do not stop when the limbs are flexed, whereas jitteriness does. Status epilepticus: continuous seizures lasting 30 minutes or recurrent seizures

CHECK	LOOK	INVESTIGATE	TREAT
<p>Neonatal seizures occurs with the following conditions, check if they are known to be present</p> <ul style="list-style-type: none"> • Hypoxic ischaemic encephalopathy • Intracranial haemorrhage • Meningitis • Hypoglycaemia • Hypocalcaemia • Hypomagnesaemia • Hypo- or hypernatraemia • Drug withdrawal • Inborn errors of metabolism 	<ul style="list-style-type: none"> • Subtle signs: eye deviation, eyelid fluttering, bucco-lingual movement or pedalling of arms and legs • Focal: tonic or clonic • Generalised: multifocal rhythmic jerking, generalised posturing or myoclonic • Apnoea (especially in a term infant) 	<p>Measure serum Glucose If cause is not known</p> <ul style="list-style-type: none"> • Measure serum magnesium, calcium and sodium. • Do a lumbar puncture if sepsis / meningitis is suspected. <p>If no cause can be found contact a paediatrician or neonatologist for further investigations and management</p>	<p>Treat electrolyte and glucose abnormalities and sepsis</p> <ul style="list-style-type: none"> • Hypocalcaemia – < 1.8mmol/L give calcium gluconate 10%, IV, 1 – 2 ml / kg / dose over 10 minutes under ECG control • Hypomagnesemia – Magnesium < 0.6mmol/L give magnesium sulphate 50%, IV, 0.25 ml/kg over 3 minutes as a single dose • Hypoglycaemia (pg.33) • Pyridoxine deficiency – Pyridoxine IV/IM 20mg /kg <p>For recurrent seizures or seizures lasting > 3 minutes</p> <ul style="list-style-type: none"> • Phenobarbitone 20 mg/kg IV infused over 10 min • If seizures persist give another dose of phenobarbitone 20 mg/kg/ IV up to 40mg/kg and give maintenance 4mg/kg/day starting 12 – 24 hours after the loading dose. • Babies with seizures refractory to phenobarbitone should be referred to a level 2 hospital for ICU admission and administration of a second line drug.

MAINTENANCE TREATMENT

- This is considered for neonates with underlying brain damage. Continue until neonate is seizure free for 2 weeks, then slowly taper to stop
- If seizures recur then continue with maintenance therapy

3.7 NEONATAL JAUNDICE

Physiological jaundice is common. It usually starts on day 3, and seldom lasts beyond day 10. Treatment is usually not needed as the bilirubin is seldom above 275 $\mu\text{mol/L}$ or $> 85 \mu\text{mol/L}$ at 24 hours

RISK FOR JAUNDICE	INVESTIGATIONS	TREATMENT
Uncommon but potentially severe <ul style="list-style-type: none"> Jaundice on day 1 	<ul style="list-style-type: none"> Do a total serum bilirubin (TSB) & haemoglobin level Do blood group (ABO and rhesus) and Coombs test Check the mother's blood groups (ABO and Rhesus) 	<ul style="list-style-type: none"> Start phototherapy immediately Check the TSB 6 hourly
<ul style="list-style-type: none"> Mother's blood group Rh negative, or O 	<ul style="list-style-type: none"> Check the TSB at 6 hours of age Do a Coombs test, if the TSB is rising $>8,5 \mu\text{mol/L/hour}$ 	<ul style="list-style-type: none"> If the TSB is $>80 \mu\text{mol/L}$, start phototherapy Only if the Coomb's test positive, give IV gamma-globulin 500mg over 1 hour
<ul style="list-style-type: none"> Prolonged jaundice (>14 days) 	<ul style="list-style-type: none"> Do conjugated and unconjugated bilirubin levels 	<ul style="list-style-type: none"> Consult a paediatrician for further management
Common <ul style="list-style-type: none"> Jaundice after day 1 Preterm baby Excessive weight loss 	<ul style="list-style-type: none"> Do a TSB Do a daily TSB until day 5, or until the TSB is going down Do TSB and U&E 	<ul style="list-style-type: none"> Start phototherapy if TSB above the line on the chart Start phototherapy if TSB above the line on the chart Start phototherapy if TSB above the line on the chart Rehydrate

PHOTOTHERAPY

Start phototherapy while waiting for the TSB result

- If the TSB is above the line on the graph, start phototherapy.
- Check the level for exchange transfusion on the second graph. This varies depending on the baby's weight, age and illness
- Repeat the TSB every 12 – 24 hours, depending on the severity of the jaundice.
- Ensure that the baby is getting an adequate fluid intake.
- Encourage breastfeeding, as it enhances the excretion of bilirubin.
- Stop phototherapy when the TSB is $50 \mu\text{mol/L}$ lower than the line on graph, and repeat the TSB the next day

Notes on phototherapy

- The baby should be naked
- Cover the baby's eyes when under phototherapy (remove the cover for feeding)
- Turn the baby over every hour
- Do not cover the incubator, or cot, or phototherapy lights with blankets or sheets

EXCHANGE TRANSFUSION

- Exchange transfusion is needed if the TSB is above the line on the exchange transfusion graph.
- A baby should be referred for exchange transfusion:
 - If the TSB level is close to, or is above, the exchange transfusion level.
 - If the TSB is rising at more than $17 \mu\text{mol/L/hour}$
 - If there are signs of bilirubin encephalopathy
- Exchange transfusions should be discussed with, and if at all possible, done at the level 2 and 3 hospitals
- In a newborn with jaundice, always determine the degree of jaundice by measuring the TSB and plotting this on a graph.
- The result of the TSB needs to be available within 1 hour from the laboratory
- Bilichecks can be used to screen for jaundice. However, if the level is $>200 \mu\text{mol/L}$, take blood for a TSB and start phototherapy.

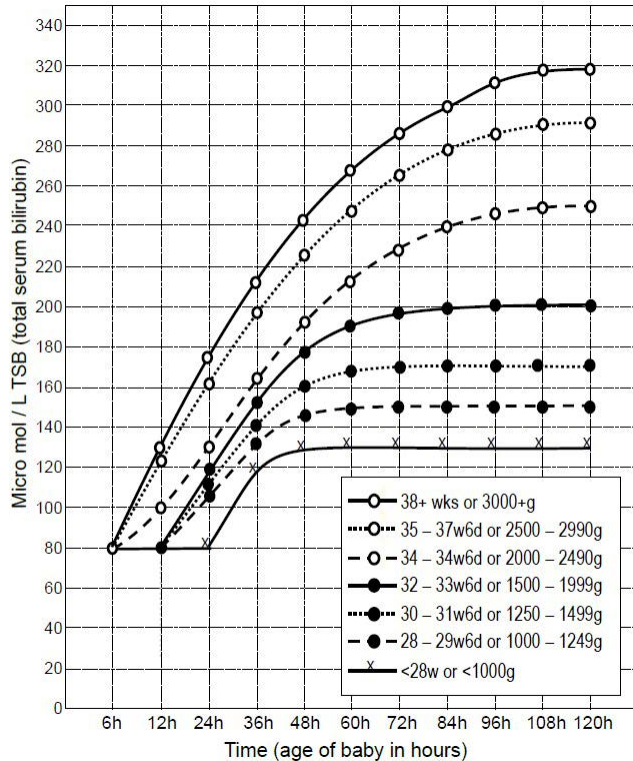
3.7 NEONATAL JAUNDICE (continued)

PHOTOTHERAPY

GUIDELINES FOR ALL WEIGHTS AND GESTATIONS

In presence of sepsis, haemolysis, acidosis or asphyxia, use one line lower (gestation below) or levels 20µmol lower if <1000g

If gestational age is accurate, use gestational age (weeks) rather than body weight.

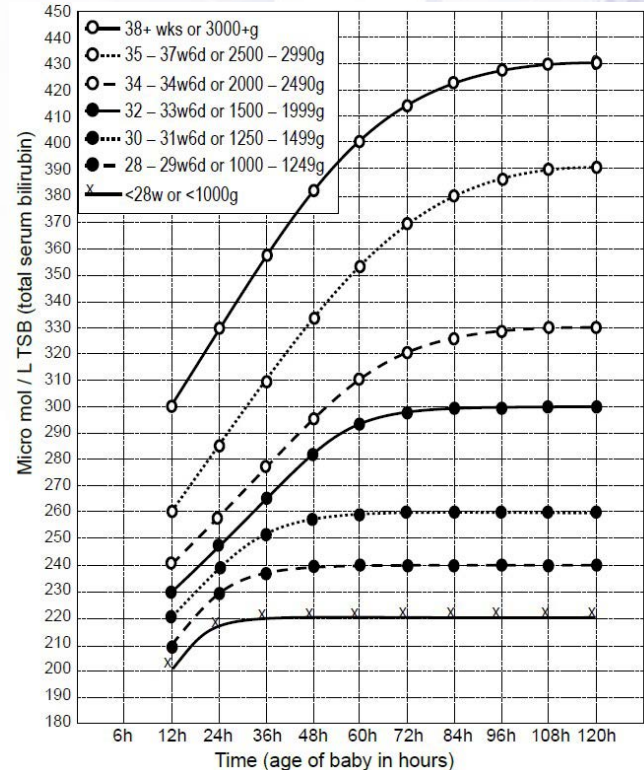


EXCHANGE TRANSFUSION

GUIDELINES FOR ALL WEIGHTS AND GESTATIONS

In presence of sepsis, haemolysis, acidosis or asphyxia, use one line lower (gestation below) or levels 20µmol lower if <1000g

If gestational age is accurate, use gestational age (weeks) rather than body weight.



3.8 CONGENITAL ABNORMALITIES

Counsel the parents, confirm the diagnosis and provide information to the parents about the condition, treatment options and the need for referral.

FEATURES	CLASSIFICATION	MANAGEMENT
<ul style="list-style-type: none"> A meningocele is an open lesion over the spine, only covered by membranes. A myelomeningocele is an open lesion over the spine with nerve tissue in the sac. There is lower limb paralysis with bladder and bowel affected. Many children have an associated hydrocephalus. 	NEURAL TUBE DEFECT/ SPINA BIFIDA	<ul style="list-style-type: none"> Cover the lesion with sterile opsite or cling film to prevent damage, leakage and infection. Babies who do not have any neurological deficit at birth should be urgently referred to a tertiary neurosurgical service for immediate closure. Refer all babies electively to the neurosurgical service for repair, except when there is anencephaly or another major congenital abnormality Monitor the head circumference of babies daily while in hospital and weekly thereafter. Refer early and urgently if hydrocephalus develops. (80% of children will develop hydrocephalus either before or after closure of the lesion) Refer and follow up at a special clinic that will monitor development, provide rehabilitation and bladder and bowel care. Counsel the mother. The mother must be advised to plan her next pregnancy and to take folic acid before she becomes pregnant
<ul style="list-style-type: none"> An omphalocele is a defect in the abdominal wall where the abdominal contents are covered with peritoneum A gastroschisis is a defect in the abdominal wall where the viscera have no covering Imperforate anus 	MAJOR GASTROINTESTINAL ABNORMALITY	<ul style="list-style-type: none"> Keep the baby nil per mouth Commence IV fluids (pg.34-35) Pass a nasogastric tube and leave it on open drainage Cover the defect with cling film not with soaked gauze Ensure that the baby is kept warm Refer to a tertiary paediatric surgical centre
<ul style="list-style-type: none"> A head circumference above the 97th centile is called macrocephaly. Hydrocephalus is a cause of macrocephaly. 	MACROCEPHALY HYDROCEPHALUS	<ul style="list-style-type: none"> If the head is >97th centile then refer immediately to a tertiary centre for neuro-imaging. Surgery for hydrocephalus is an emergency and should not be delayed.
<ul style="list-style-type: none"> Difficult to decide on the gender of the baby by looking at the genitalia 	AMBIGUOUS GENITALIA	<ul style="list-style-type: none"> Advise the parents that the gender of the baby is not clear Check the Glucose, Na, K and Urea immediately for hypoadosteronism and hypocortisolism Monitor blood pressure Refer the baby as soon as possible to a paediatrician for further management
<ul style="list-style-type: none"> A head circumference is < 3rd centile, on the growth chart 	MICROCEPHALY	<ul style="list-style-type: none"> Compare the weight and head circumference centiles Assess for other abnormalities Determine the cause. It may be due to a congenital infection, a structural abnormality of the brain or be part of a genetic syndrome. Refer to a paediatrician.

3.8 CONGENITAL ABNORMALITIES (continues)

FEATURES	CLASSIFICATION	MANAGEMENT
<ul style="list-style-type: none"> • Extreme plantar flexion (bending of the foot downwards) at the ankle, and medial (inward) angulation of the forefoot. This is called Talipes Equinovarus. This may be due to an in-utero position, developmental abnormality of the bone or cartilage, neuromuscular problem, or a spinal cord problem. 	CLUB FOOT	<ul style="list-style-type: none"> • Assess for other problems of the bone, spine or CNS • If there is any neuromuscular problem or other abnormality refer the baby to the tertiary paediatric service • Refer the baby immediately to the orthopaedic service, who can commence gentle manipulation, serial splinting and plaster of Paris • If these measures do not work surgical correction must be planned at 10 weeks. Delay in management of the clubfoot may lead to permanent disability
<ul style="list-style-type: none"> • A gap occurs in the lip, gum margin and / or palate due to failure or incomplete closure of the skin, bone and or muscles. The cleft may be unilateral, bilateral, midline, complete or incomplete. It may be associated with a genetic cause, environmental factor or teratogen, but in most cases is multifactorial. 	CLEFT LIP AND / OR PALATE	<ul style="list-style-type: none"> • Conduct a thorough examination to exclude other problems or syndromes. If these are found or suspected, refer to the tertiary unit for further assessment • Counsel the mother • Assist with feeding; breastfeeding is possible • Refer early to a cleft lip clinic / maxillofacial clinic at a tertiary hospital. They may make a plate to aid feeding and then repair the lip at around 3 months and the palate at around 9 months
<ul style="list-style-type: none"> • Abnormal position of legs • Poor limb movement • Pain on movement of the limb 	LIMB INJURY	<ul style="list-style-type: none"> • Counsel the parents • Handle gently • Do an X-ray of the affected limb • Check for a fracture or syphilis on X-ray • If a fracture is present, immobilise the limb and treat with advice from orthopaedic doctors • If an arm is not moving, and flaccid, and no fracture is present, a brachial plexus palsy is likely. Encourage gentle movements and refer to physiotherapy. If not improving, refer to orthopaedic surgery
<ul style="list-style-type: none"> • One major abnormality and 2 minor abnormalities <u>OR</u> • 3 minor abnormalities 	MAJOR CONGENITAL ABNORMALITY	<ul style="list-style-type: none"> • These babies are likely to have a chromosomal problem • Refer to a paediatrician, or experienced genetic sister • Discuss with a paediatrician and consider taking blood for chromosome analysis. (Heparinised specimen) • if there are features of Trisomy 13, 18 or 21 take blood for QF PCR for aneuploidy. (Purple top (FBC) tube)
<ul style="list-style-type: none"> • One or 2 minor abnormalities 	MINOR ABNORMALITY	<ul style="list-style-type: none"> • If a child has an extra digit without any bony attachment and a narrow pedicle, it can be tied off. • Discuss with a paediatrician

3.9 SYPHILIS

Congenital syphilis is a chronic intrauterine infection caused by the spirochaete, *Treponema pallidum*. If the mother was untreated during pregnancy, the baby has a 50% chance of becoming infected.

CHECK	LOOK, LISTEN FEEL	SIGNS	CLASSIFY	TREATMENT
Mother's RPR <ul style="list-style-type: none"> • Positive, titre > 1:4 • Untreated • Treated < 1 month before delivery • Unknown <p>Note: <i>All treated infants should have their titre checked at 3 months to ensure the titre decreases</i></p>	<ul style="list-style-type: none"> • Hepatosplenomegaly • Petechiae • Pallor • Low birth weight • Respiratory distress • Blisters on hands and feet • Osteitis • Large, pale placenta 	<ul style="list-style-type: none"> • Mother RPR positive AND • Any of the clinical signs listed 	CONGENITAL SYPHILIS	<ul style="list-style-type: none"> • NOTIFY • Admit to neonatal unit • Procaine penicillin 50 000 units/ kg IM daily for 10 days, OR • Penicillin G 50 000 units/ kg IV bd for 10 days • Do an LP
		<ul style="list-style-type: none"> • Mother RPR positive AND • Mother treated < 1 month before delivery AND • Baby is well 	INCOMPLETELY TREATED FOR SYPHILIS EXPOSURE	<ul style="list-style-type: none"> • Administer Benzathine penicillin 50 000 units/ kg IM - one dose only to baby • Ensure mother completes treatment
		<ul style="list-style-type: none"> • Mothers RPR status is not known AND • Baby is well 	UNKNOWN MATERNAL RPR, PROPHYLAXIS REQUIRED	<ul style="list-style-type: none"> • Administer Benzathine penicillin 50 000 units / kg IM - one dose only to baby • Ensure mother has a RPR test and reclassify
		<ul style="list-style-type: none"> • Mother RPR positive AND • Fully treated at least one month before delivery AND • Baby is well 	COMPLETED TREATMENT FOR SYPHILIS EXPOSURE	<ul style="list-style-type: none"> • No treatment required

3.10 TUBERCULOSIS

Assess all infants who have had exposure to TB, for clinical and laboratory evidence of Tuberculosis, and provide treatment or prophylaxis

EXPOSURE TO TB	CLINICAL SIGNS	INVESTIGATE	SIGNS	CLASSIFICATION	PROVIDE ANTI-TUBERCULOSIS TREATMENT																								
<p>Tuberculosis exposure in mother or close family contact</p> <ul style="list-style-type: none"> Mother has tuberculosis and on TB treatment for < 2 months Mother has tuberculosis on TB treatment for > 2 months but has not shown good clinical response Mother on TB treatment > 2 months and is responding to treatment, sputum negative 	<p>Does the baby have?</p> <ul style="list-style-type: none"> Poor feeding and poor weight gain Abdominal distention or hepatosplenomegaly Prolonged jaundice Pneumonia not responding to treatment 	<p>Gastric washings</p> <ul style="list-style-type: none"> TB culture GeneXpert <p>Chest X Ray</p> <ul style="list-style-type: none"> Miliary pattern Lymph nodes Cavitations <p>Abdominal sonar</p> <ul style="list-style-type: none"> Large lymph nodes <p>Placental biopsy</p> <ul style="list-style-type: none"> TB culture (in saline) histology (in formalin) 	<p>TB meningitis</p>	TB MENINGITIS	<p>6 months treatment of all 4 drugs below</p> <ul style="list-style-type: none"> INH – 15 – 20mg/kg/day Rifampicin 15 – 20 mg/kg/day Pyrazinamide 35mg/kg/day Ethionamide 15 – 20 mg/kg/day <p>Prednisone 2 – 4mg/kg/day x 4 weeks then taper over 2 weeks</p> <p>Check ALT and watch for jaundice</p>																								
			<p>Miliary Tuberculosis</p> <p>Cavitating TB</p> <p>Extrapulmonary TB</p>	DISSEMINATED TUBERCULOSIS	<p>Treat with</p> <ul style="list-style-type: none"> INH10 – 15mg/kg/day X 6 months Rifampicin 15 – 20 mg/kg/day x 6 months Pyrazinamide 30 – 40 mg/kg/day x 2 months Ethionamide 15 – 20 mg/kg/day x 2 months <p>If HIV infected</p> <ul style="list-style-type: none"> Fast-track for ARV treatment Add pyridoxine 12,5mg daily for 6 months <p>Give BCG on completion of treatment.</p> <p>If HIV positive give BCG if asymptomatic.</p>																								
			<p>Positive TB test or CXR</p>	CONGENITAL TB	<table border="1"> <thead> <tr> <th></th> <th colspan="2">Intensive Phase for 2 months</th> <th>Continuation phase for 4 months</th> </tr> <tr> <th>Body Weight (kg)</th> <th>RH Tablets (60/60)</th> <th>PZA 500mg</th> <th>RH Tablets (60/60)</th> </tr> </thead> <tbody> <tr> <td>< 2 kg</td> <td>See individual drugs above</td> <td>See individual drugs above</td> <td>See individual drugs above</td> </tr> <tr> <td>2 – 2.9</td> <td>½ tablet</td> <td></td> <td>½ tablet</td> </tr> <tr> <td>3 – 3.9</td> <td>¾ tablet</td> <td>¼ tablet</td> <td>¾ tablet</td> </tr> <tr> <td>4 – 5.9</td> <td>1 tablet</td> <td>¼ tablet</td> <td>1 tablet</td> </tr> </tbody> </table>		Intensive Phase for 2 months		Continuation phase for 4 months	Body Weight (kg)	RH Tablets (60/60)	PZA 500mg	RH Tablets (60/60)	< 2 kg	See individual drugs above	See individual drugs above	See individual drugs above	2 – 2.9	½ tablet		½ tablet	3 – 3.9	¾ tablet	¼ tablet	¾ tablet	4 – 5.9	1 tablet	¼ tablet	1 tablet
				Intensive Phase for 2 months		Continuation phase for 4 months																							
Body Weight (kg)	RH Tablets (60/60)	PZA 500mg	RH Tablets (60/60)																										
< 2 kg	See individual drugs above	See individual drugs above	See individual drugs above																										
2 – 2.9	½ tablet		½ tablet																										
3 – 3.9	¾ tablet	¼ tablet	¾ tablet																										
4 – 5.9	1 tablet	¼ tablet	1 tablet																										
<p>Mother has TB and < 2 months of treatment or is not responding to TB treatment</p>	HIGH TB EXPOSURE RISK																												
<ul style="list-style-type: none"> Mother >2 months of TB treatment and is smear negative <u>AND</u> Baby asymptomatic 	LOW RISK TB PROPHYLAXIS	<ul style="list-style-type: none"> Give BCG on completion of treatment, if HIV uninfected. If HIV infected give BCG if asymptomatic. Give INH for 6 months at 10mg/kg /day <table border="1"> <thead> <tr> <th>Body Weight (kg)</th> <th>Daily Isoniazid (INH) (100mg tablet) 10mg /kg daily</th> </tr> </thead> <tbody> <tr> <td>< 2 kg</td> <td>10 mg/kg daily</td> </tr> <tr> <td>2 – 3.4</td> <td>¼ tablet</td> </tr> <tr> <td>3.5 – 4.9</td> <td>½ tablet</td> </tr> <tr> <td>5 – 7,4kg</td> <td>¾ tablet</td> </tr> </tbody> </table>	Body Weight (kg)	Daily Isoniazid (INH) (100mg tablet) 10mg /kg daily	< 2 kg	10 mg/kg daily	2 – 3.4	¼ tablet	3.5 – 4.9	½ tablet	5 – 7,4kg	¾ tablet																	
Body Weight (kg)	Daily Isoniazid (INH) (100mg tablet) 10mg /kg daily																												
< 2 kg	10 mg/kg daily																												
2 – 3.4	¼ tablet																												
3.5 – 4.9	½ tablet																												
5 – 7,4kg	¾ tablet																												

3.11 HIV AFFECTED MOTHERS AND BABIES

This guideline is based on the SA 2019 National PMTCT guidelines. Please keep updated if there are changes and adapt this guideline accordingly.

STEP	ASSESS AND CLASSIFY	CARE															
<p>Step 1. Identify the Mother's HIV status and provide care to her</p> <ul style="list-style-type: none"> • What is the mother's HIV status? • If the mother is positive, is she on ART? • If not on ART, should she commence ART? 	<p>Mother HIV positive</p> <ul style="list-style-type: none"> • Newly diagnosed and not yet started on ART before or during delivery • Breastfeeding mother diagnosed 72 hours after delivery • Less than 4 weeks of effective ART before delivery • On ART with VL>1000 copies/ml at delivery or (most recent VL taken during last 12 weeks) • No mother HIV VL results in last 12weeks • Mother's HIV status unknown <p>HIGH RISK Mother HIV positive on lifelong ART VL <1000copies/ml</p> <p>LOW RISK Mother HIV negative</p>	<ul style="list-style-type: none"> • Do birth HIV- PCR to identify HIV transmission that occurred in-utero • AZT twice daily for minimum of 6weeks and NVP daily minimum of 12weeks (check latest PMTCT guidelines for high risk infants) • If no maternal VL : Do maternal VL and check results in 3-5 days postnatal visit the re-classify as high risk or low risk and adjust prophylaxis accordingly • Encourage maternal ART adherence • Ensure treatment and follow up arrangements • Perform a rapid HIV test on the mother immediately or on the baby • if mother unavailable or abandoned to determine exposure • If results positive : <ul style="list-style-type: none"> ◦ Do baby HIV-PCR ◦ Provide High- risk prophylaxis <p>Please check latest PMTCT guidelines, as they are frequently updated</p> <ul style="list-style-type: none"> • Do birth HIV PCR • NVP daily for 6 weeks • Encourage maternal ART adherence • Ensure treatment and follow up arrangement <p>If HIV test done > 6 weeks ago, re-test the mother</p>															
<p>Step 2. . Provide ARV prophylaxis for HIV exposed baby up to 6weeks</p>	Prophylactic regimes	<table border="1"> <thead> <tr> <th>Risk Profile</th> <th>NVP</th> <th>AZT</th> </tr> </thead> <tbody> <tr> <td>Low risk, whether breastfed or formula fed</td> <td>6 weeks</td> <td>No AZT</td> </tr> <tr> <td>High Risk , and breastfed</td> <td>Minimum of 12 weeks</td> <td>6 weeks</td> </tr> <tr> <td>High Risk , and exclusively formula fed</td> <td>6 weeks</td> <td>6 weeks</td> </tr> </tbody> </table>	Risk Profile	NVP	AZT	Low risk, whether breastfed or formula fed	6 weeks	No AZT	High Risk , and breastfed	Minimum of 12 weeks	6 weeks	High Risk , and exclusively formula fed	6 weeks	6 weeks			
	Risk Profile	NVP	AZT														
	Low risk, whether breastfed or formula fed	6 weeks	No AZT														
High Risk , and breastfed	Minimum of 12 weeks	6 weeks															
High Risk , and exclusively formula fed	6 weeks	6 weeks															
Prophylactic doses	<table border="1"> <thead> <tr> <th colspan="3">NVP</th> </tr> <tr> <th>Age</th> <th>Current wt</th> <th>Dose</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Birth to 6weeks</td> <td><2kg, >35weeks gestation</td> <td>4 mg/kg/dose twice daily</td> </tr> <tr> <td>2.0 - 2.49kg</td> <td>1ml (10mg) daily</td> </tr> <tr> <td>>2.5 kg</td> <td>1.5ml (15mg) daily</td> </tr> <tr> <td colspan="3">Infants <2000 g; Birth -2weeks of age: NVP 2mg/kg/dose (0.2ml/kg/dose) daily 2-6weeks of age: NVP 4mg/kg/dose (0.4ml/kg/dose) daily</td> </tr> </tbody> </table>	NVP			Age	Current wt	Dose	Birth to 6weeks	<2kg, >35weeks gestation	4 mg/kg/dose twice daily	2.0 - 2.49kg	1ml (10mg) daily	>2.5 kg	1.5ml (15mg) daily	Infants <2000 g; Birth -2weeks of age: NVP 2mg/kg/dose (0.2ml/kg/dose) daily 2-6weeks of age: NVP 4mg/kg/dose (0.4ml/kg/dose) daily		
NVP																	
Age	Current wt	Dose															
Birth to 6weeks	<2kg, >35weeks gestation	4 mg/kg/dose twice daily															
	2.0 - 2.49kg	1ml (10mg) daily															
	>2.5 kg	1.5ml (15mg) daily															
Infants <2000 g; Birth -2weeks of age: NVP 2mg/kg/dose (0.2ml/kg/dose) daily 2-6weeks of age: NVP 4mg/kg/dose (0.4ml/kg/dose) daily																	
Baby ill and cannot take oral	Consult a Paediatrician about using IV AZT																
<p>Step 3. Safely feed HIV exposed baby</p>	Baby < 1.8 kg	<ul style="list-style-type: none"> • EBM according to guidelines on feeds and fluids for low birth weight babies • Initiate breastfeeding before discharge 															
	Exclusively breastfeeding	<ul style="list-style-type: none"> • Encourage exclusive breast feeding for 6months and ensure NVP prophylaxis to the baby and ART to the mother 															

3.11 HIV AFFECTED MOTHERS AND BABIES (continued)

STEP	ASSESS AND CLASSIFY	CARE																									
Step 3. Safely feed HIV exposed baby (continued)	Breastfeeding with elevated VL	<ul style="list-style-type: none"> It is recommended that women with a VL=\geq 1000copies/ml on 1st line ART to continue to breastfeed baby prophylaxis should be extended Breastfeeding in woman falling 2nd and 3rd line not recommended(refer to dietician for formula feeding) 																									
	Mother has decided on formula feeding and can safely prepare and provide it.	<ul style="list-style-type: none"> Confirm that this is the best choice for her and provide her with assistance 																									
Step 4. Determine HIV status of HIV exposed baby	Do HIV PCR test according to schedule for HIV exposed infant (at birth, 10weeks age, 6months age, 6weeks post cessation of breastfeeding and anytime baby is unwell and Follow up results	<ul style="list-style-type: none"> If HIV –PCR results Negative: Continue with prophylaxis and , do all routine HIV tests according to age and schedule for HIV exposed infant 																									
		<ul style="list-style-type: none"> HIV –PCR results indeterminate: discuss immediately with Paediatrician 																									
Step 5. Positive HIV DNA PCR test	HIV DNA PCR test positive at any stage	<ul style="list-style-type: none"> Stop NVP (and AZT) Confirm positive results with 2nd PCR or VL and baseline assessment Initiate ART on the same day (refer to latest national HIV guidelines) 																									
Step 6. Provide ARV prophylaxis from 6 weeks for the duration of breastfeeding	Mother is on ART and VL is <1000 copies/ml OR the baby is on exclusive replacement feeding	<ul style="list-style-type: none"> No further ARV prophylaxis is required to the baby Ensure that the mother has her ARV treatment, and is taking it. 																									
	Mother is not on ART yet or has been on ART for < 3 months and breastfeeding	<ul style="list-style-type: none"> AZT twice daily for 6 weeks and NVP daily for minimum of 12 weeks regardless of infant's age. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">NVP</th> <th colspan="3">AZT</th> </tr> <tr> <th>Age wt</th> <th>Dose</th> <th>Age</th> <th>Weight</th> <th>dose</th> </tr> </thead> <tbody> <tr> <td>6 weeks - 6 months</td> <td>2ml (20mg) daily</td> <td rowspan="3">>6 weeks (doses according to ART Drug Dosing Chart for children)</td> <td rowspan="2"><3kg</td> <td rowspan="2">4mg/kg/dose (0.4ml/kg/dose) twice daily</td> </tr> <tr> <td>6 months -9 months</td> <td>3ml (30mg) daily</td> </tr> <tr> <td>9 months until 4weeks after breastfeeding has stopped</td> <td>4ml (40mg) daily</td> <td>3.0 to 5.9kg</td> <td>6ml twice daily</td> </tr> <tr> <td></td> <td></td> <td></td> <td>6.0 to 7.9kg</td> <td>9ml twice daily</td> </tr> </tbody> </table> <p>Check HIV DNA PCR test 6weeks after breastfeeding is discontinued.</p>	NVP		AZT			Age wt	Dose	Age	Weight	dose	6 weeks - 6 months	2ml (20mg) daily	>6 weeks (doses according to ART Drug Dosing Chart for children)	<3kg	4mg/kg/dose (0.4ml/kg/dose) twice daily	6 months -9 months	3ml (30mg) daily	9 months until 4weeks after breastfeeding has stopped	4ml (40mg) daily	3.0 to 5.9kg	6ml twice daily				6.0 to 7.9kg
NVP		AZT																									
Age wt	Dose	Age	Weight	dose																							
6 weeks - 6 months	2ml (20mg) daily	>6 weeks (doses according to ART Drug Dosing Chart for children)	<3kg	4mg/kg/dose (0.4ml/kg/dose) twice daily																							
6 months -9 months	3ml (30mg) daily																										
9 months until 4weeks after breastfeeding has stopped	4ml (40mg) daily		3.0 to 5.9kg	6ml twice daily																							
			6.0 to 7.9kg	9ml twice daily																							
Step 7. Provide cotrimoxazole prophylaxis from 6 weeks	Baby from 6 weeks	<ul style="list-style-type: none"> Provide Cotrimoxazole prophylaxis until breastfeeding is discontinued, or baby is stable on ARV treatment Cotrimoxazole Dose 2.5ml daily PO or 0.5ml/kg/day PO if < 2.5kg 																									

3.12 CARE OF HIV INFECTED BABIES

Provide on-going care to the HIV infected baby, ARV initiation should commence while still in hospital, and in consultation with a neonatologist or paediatrician.

STEPS, ASK	CHECK, LAB	TREAT, OBSERVE, CARE	COUNSEL AND FOLLOW UP												
1. Confirm the Positive HIV status	<ul style="list-style-type: none"> Confirm that the HIV DNA PCR test is positive Take blood for Viral Load, CD4count, U&E and Hb or FBC and ALT (genotype if mother is failing 2nd /3rd line ART) 	<ul style="list-style-type: none"> Follow steps below to prepare for ART initiation 	<ul style="list-style-type: none"> Start counselling on adherence 												
2. Clinical assessment Take a comprehensive history	<ul style="list-style-type: none"> Do a full clinical examination. Check for underlying opportunistic infections. 	<ul style="list-style-type: none"> Treat any underlying opportunistic infections 													
3. Provide cotrimoxazole prophylaxis from 6 weeks	<ul style="list-style-type: none"> If baby is 6 weeks of age or more, is baby on cotrimoxazole? 	<ul style="list-style-type: none"> Prescribe cotrimoxazole dose 0.5ml/kg/dose PO if more than 6 weeks of age 													
4. Screen for Congenital TB	<ul style="list-style-type: none"> Does mother have signs of TB or is she on TB treatment? 	<ul style="list-style-type: none"> Refer to pg.58 for the management of TB 													
5. Check readiness to start ART	<ul style="list-style-type: none"> Check the results of VL, CD4, FBC, U&E and cholesterol & triglycerides If VL is undetectable, repeat the HIV DNA PCR test 	<ul style="list-style-type: none"> If Hb is low, treat 	<ul style="list-style-type: none"> Adherence counselling 												
6. Initiate HAART	<ul style="list-style-type: none"> Provide counselling for mother/care-giver on positive birth HIV PCR and start ART immediately 	<table border="1"> <thead> <tr> <th>Drug</th> <th>Dosage</th> <th>Precautions</th> </tr> </thead> <tbody> <tr> <td>Lamivudine (3TC)</td> <td>2mg/kg /dose twice daily</td> <td></td> </tr> <tr> <td>Zidovudine (AZT)</td> <td>4mg/kg /dose twice daily</td> <td></td> </tr> <tr> <td>Nevirapine (NVP)</td> <td>6mg/kg/dose twice daily</td> <td></td> </tr> </tbody> </table> <p>Babies less than 2.5kg - Discuss with a paediatrician.</p>	Drug	Dosage	Precautions	Lamivudine (3TC)	2mg/kg /dose twice daily		Zidovudine (AZT)	4mg/kg /dose twice daily		Nevirapine (NVP)	6mg/kg/dose twice daily		<ul style="list-style-type: none"> If in hospital observe for side effects If discharged follow up in a week or two
Drug	Dosage	Precautions													
Lamivudine (3TC)	2mg/kg /dose twice daily														
Zidovudine (AZT)	4mg/kg /dose twice daily														
Nevirapine (NVP)	6mg/kg/dose twice daily														
7. Adjust infant ART at 1 month	<ul style="list-style-type: none"> Clinical review Start on co-trimoxazole prophylaxis Adjust medication , if >3kg : switch NVP to Kaletra and AZT to ABC if (doses as per SA NDOH dosing chart) if <3kg : switch NVP to Kaletra, 1ml twice daily and AZT 12 mg/kg/dose twice daily and 3TC-4mg/kg/dose twice daily 		<ul style="list-style-type: none"> Ongoing adherence cancelling Monthly follow up and ongoing adherence cancelling for 6 months 												
8. Monitoring	<ul style="list-style-type: none"> Kaletra - Reduced metabolism by the liver and reduced kidney function can lead to cardiac and renal toxicity, CNS depression and lactic acidosis, especially in pre-term infants either due to lopinovar or ethanol, polypropylene glycol in the solution Check renal function and osmolality every week Check for clinical signs of CNS depression, hypotonia, seizures and complete AV block. 		<ul style="list-style-type: none"> Follow up weekly for the first 4 week if baby is ready to be discharged 												

DISCHARGE AND FOLLOW-UP

A close-up photograph of a woman in a hospital gown holding a newborn baby. The baby is wrapped in a white blanket and is sleeping peacefully. The woman is looking down at the baby with a gentle expression. The background is slightly blurred, showing a hospital bed and a wooden floor. The overall tone is warm and caring.

- 4.1 Transfer and referral
- 4.2 Discharge
- 4.3 Neonatal follow up
- 4.4 Development chart (0-18 months)

4.1 TRANSFER AND REFERRAL

The key to successful transport that will minimise the risk for the baby, is accurate and detailed communication among the respective staff of the referring hospital, the transport team and the accepting hospital.

The list of conditions for which a baby should be referred is not exhaustive, the rule is: **IF IN DOUBT, DISCUSS WITH THE DOCTOR AT THE REFERRAL HOSPITAL**

WHO SHOULD BE REFERRED

NB: District hospital should discuss patient with consultant at regional hospital, and regional hospital should discuss patient with consultant at tertiary hospital.

- Babies with birth weight 1000g-1500g who are unwell
- Respiratory distress not manageable with nasal prongs O₂, and no CPAP available
- Uncontrolled seizures
- Recurrent apnoea in babies weighing >1000g
- Hypoglycaemia not responding to treatment in 1 hour
- Jaundice: >200 umol/L on day 1
400 umol/L at any time
>300 umol/L at any time, if weight <2.5kg
- Persistent vomiting
- Bile stained vomiting
- Surgical problems

NBDysmorphic babies who are otherwise well need to be seen by a paediatrician but this is not a reason for urgent transfer.**

IMPORTANT THINGS TO CHECK BEFORE TRANSFER

- Name band of the baby
- Vital signs: temp, RR, PR, colour, activity - do regularly up until the time of transfer
- Blood glucose
- Secure airway
- Secure and reliable IV line
- Nasogastric tube in situ, if applicable
- Ensure that the transferring ambulance has a functioning warm transport incubator, resuscitation equipment, oxygen in the ambulance, a small oxygen cylinder for transport, and a pulse oximeter.
- If no transport incubator, it is better to transport the baby skin-to-skin with the mother.

DUTY OF REFERRING CLINICIAN

- Inform the referring hospital of:
 - Progress of the baby
 - Condition of the baby on transfer
 - When the ambulance leaves your hospital
- Tear out the first page of the newborn record and write the referral letter on the back
- Nursing observations must be done while waiting for, and immediately before discharge
- Adequate medication, and feeds must be available for transit
- The mother's details and contact numbers must be in the baby's records if she cannot accompany the baby

TRANSFER OF A BLUE BABY: CONGENITAL HEART DISEASE

- Resuscitate and stabilise
- Give Prostaglandin E₂, ¼ tablet half hourly. Crush the tablet, mix with 2-5ml of water and give it through a nasogastric tube.
- Intubate if at all possible
- Discuss the use of oxygen
- Treat shock before transfer
- Keep the baby nil per mouth

4.2 DISCHARGE

When to discharge	<ul style="list-style-type: none"> • Low birth weight baby: When baby is at least 1,8kg and KMC score is more than 20 • Baby with serious infections: Completed course of treatment and feeding well • Baby with encephalopathy and seizures: Completed treatment, seizures controlled and feeding well • Other babies: Once treatment is completed, baby is feeding well, mom is able to provide home care
Give Immunisations before discharge	<ul style="list-style-type: none"> • Give BCG and OPV0 on discharge if less than 6 weeks of age. • If more than 6 weeks and baby has not received OPV0 and BCG yet <ul style="list-style-type: none"> • Give BCG, OPV0, DaPT-Hib-IPV1, HepB1, PCV1, and RV1 – then give OPV1 in 4 weeks with 10 week immunisations. • If 6 weeks and has received BCG and OPV0 <ul style="list-style-type: none"> • Give BCG, OPV1, DaPT-Hib-IPV1, HepB1, PCV1, and RV1
Document information in the Road to Health booklet	<ul style="list-style-type: none"> • Document information on the Road to health booklet on the following pages <ul style="list-style-type: none"> ○ Page 2: well child visit summary at 3 days, 6 weeks and 10 weeks if applicable ○ Page 11: Details of child and family ○ Page 38: Neonatal information ○ Page 27: Immunisation ○ Page 38: PMTCT/HIV information
Counsel	<ul style="list-style-type: none"> • Counsel on exclusive breastfeeding: Refer to page 4-5, Health Promotion messages in babies up to 6 months • Counsel on any special care the child may require e.g. for HIV or other condition (pg.40)
Counsel on when to return immediately	<ul style="list-style-type: none"> • Feeding poorly • Convulsions • Fever • Cough with fast breathing • Bleeding, Diarrhoea • Pus draining from the eyes, skin pustules • Cord stump red or draining pus • Yellow hands and feet

COUNSEL ON WHEN TO RETURN FOR FOLLOW UP

<ul style="list-style-type: none"> • All babies 	<ul style="list-style-type: none"> • PHC Clinic 	3 – 6 days of age then 6 weeks and normal routine
<ul style="list-style-type: none"> • HIV exposed babies 	<ul style="list-style-type: none"> • PHC Clinic <u>OR</u> • PMTCT follow up clinic 	3 – 6 days after discharge, then 6 weeks and 10 weeks of age and monthly for first year
<ul style="list-style-type: none"> • Babies who weighed < 2 kg at birth 	<ul style="list-style-type: none"> • Neonatal follow-up 	<ul style="list-style-type: none"> • 3 days after discharge then weekly until 2.5 kg
<p>HIGH RISK: Babies who had the following problems</p> <ul style="list-style-type: none"> • Birth weight < 1.5 kg • Meningitis or sepsis • Moderate or severe neonatal encephalopathy • Severe hypoglycaemia • Required CPAP or IPPV • Major congenital abnormalities • Necrotising enterocolitis • Severe jaundice 	<ul style="list-style-type: none"> • High risk follow-up clinic 	<ul style="list-style-type: none"> • 3 days after discharge • Weekly until 2.5 kg • 9 months <p><u>OR</u> as required by the condition of the baby</p>
Birth weight < 1.5 kg	<ul style="list-style-type: none"> • Ophthalmology clinic 	<ul style="list-style-type: none"> • ROP screening at 6 weeks

4.3 NEONATAL FOLLOW UP

VISIT	ASSESS	TREAT, COUNSEL, FOLLOW UP
3 days after discharge	<ul style="list-style-type: none"> Assess and classify weight gain (pg.48) Assess and classify for priority signs 	<ul style="list-style-type: none"> Counsel on feeding Low birth weight <ul style="list-style-type: none"> Gaining well: follow up in 2 weeks Not gaining: follow up in 3 days Losing weight: readmit Multivitamin drops 0.6 ml / day Ferrous lactate 0.6 ml / day
Low birth weight visits until 2500g	<ul style="list-style-type: none"> Assess and classify weight gain (pg.48) Assess and classify for priority signs Measure and record head circumference 	<ul style="list-style-type: none"> Multivitamin drops 0.6 ml daily for 6 months Ferrous lactate 0.6 ml daily for 6 months Counsel on feeding If well at 2500g, for routine PHC clinic follow up <ul style="list-style-type: none"> Birth weight less than 1500g, and / or Serious illness (see p.xx) Follow up at 18 weeks corrected age and 9 months for developmental screen
10 weeks of age HIV exposed	<ul style="list-style-type: none"> Assess growth and feeding Do PCR Give Immunisations 	<ul style="list-style-type: none"> Counsel on feeding Get PCR result in 2 weeks. If +ve initiate on ART (pg.61) PCR–ve: routine follow up at clinic PCR–ve and breastfeeding: repeat PCR 6 weeks after stopping breastfeeding. Repeat HIV antibody test at 18 months
18 weeks corrected age	<ul style="list-style-type: none"> Assess growth and feeding Measure and record head circumference Assess development (pg.66) 	<ul style="list-style-type: none"> According to problems identified If delayed motor development, start physiotherapy
9 months corrected age	<ul style="list-style-type: none"> Assess growth and feeding Measure and record head circumference Assess development (pg.66) 	<ul style="list-style-type: none"> According to problems identified If delayed motor development, start physiotherapy If delayed speech development, assess hearing
Retinal Assessment at 6 weeks	<ul style="list-style-type: none"> Specialised assessment by ophthalmologist 	<ul style="list-style-type: none"> Specialised assessment by ophthalmologist

4.4 DEVELOPMENT CHART (0–18MONTHS)

MONTHS	GROSS-MOTOR	FINE-MOTOR-ADAPTIVE	COMMUNICATION	PERSONAL-SOCIAL
18	<ul style="list-style-type: none"> Walks well, arms down Pulls a toy Throws a ball Climbs on a chair 	<ul style="list-style-type: none"> Completes simple form board with reversal (trial and error)* 3 - 4 cube tower 	<ul style="list-style-type: none"> 2 word utterances. 6-20 words Points to one body part Points to one picture 	<ul style="list-style-type: none"> Indicates wet / dirty nappy Pulls up pants Handles spoon and cup well
15	<ul style="list-style-type: none"> Walks alone – uneven steps, arms out for balance 	<ul style="list-style-type: none"> 2 cube tower Simple form board - replaces both circles* 	<ul style="list-style-type: none"> Jabbers with expression Uses 5 words (other than mama, dada) 	<ul style="list-style-type: none"> Pulls off socks Holds and drinks from a cup Attempts to feed with a spoon - spills most
12	<ul style="list-style-type: none"> Bear walks, walks around furniture lifting one foot and stepping sideways, may walk alone 	<ul style="list-style-type: none"> Pincer grasp, releases object on request Simple form board (one circle in)* 	<ul style="list-style-type: none"> Knows own name 2 – 3 words with meaning 	<ul style="list-style-type: none"> Finger feeds Pushes arm into sleeve
10	<ul style="list-style-type: none"> Pulls to stand, walks with assistance 	<ul style="list-style-type: none"> Picks up small object between finger and thumb Clicks two cubes together 	<ul style="list-style-type: none"> Shakes head for no Waves bye bye 	<ul style="list-style-type: none"> Plays peek-a-boo with mother
9	<ul style="list-style-type: none"> Sits without support Crawls on hands and knees Pulls up to stand 	<ul style="list-style-type: none"> Immediately reaches out and holds a cube in each hand Exploratory mouthing 	<ul style="list-style-type: none"> Vocalizes deliberately Babbles 	<ul style="list-style-type: none"> Stranger anxiety Holds cup
6	<ul style="list-style-type: none"> Pulls to sit: braces shoulders and pulls to sit Prone: Lifts head and chest up Supports on extended arm Rolls from supine to prone 	<ul style="list-style-type: none"> Reaches for and grasps toy Transfers toy from one hand to the other 	<ul style="list-style-type: none"> Initiates conversation 	<ul style="list-style-type: none"> Takes everything to the mouth Pats mirror image
3	<ul style="list-style-type: none"> Pulls to sit: little or no head lag Prone: supports on forearms, lifts head, buttocks flat Rolls from prone to supine 	<ul style="list-style-type: none"> Follows through 180° Holds rattle when placed in hand 	<ul style="list-style-type: none"> Coos, chuckles and squeals 	<ul style="list-style-type: none"> Excited when sees mother Obvious pleasure at being handled
6 weeks	<ul style="list-style-type: none"> Pull to sit: some head control Prone: head to side, buttocks moderately high Moro reflex 	<ul style="list-style-type: none"> Stares Follows horizontally to 90° 	<ul style="list-style-type: none"> Startle response 	<ul style="list-style-type: none"> Smiles at mother
New-born	<ul style="list-style-type: none"> Ventral suspension: head drops, hips flexed, limbs hang Moro reflex, palmar & plantar grasp reflexes 	<ul style="list-style-type: none"> Hands fisted Closes eyes to sudden bright light 	<ul style="list-style-type: none"> Stills to sound Startles to sudden loud noises 	<ul style="list-style-type: none"> Alternates between drowsiness and alert wakefulness

CHARTS, RECORDING FORMS AND REFERENCES

- 5.1 **Drug dosages**
- 5.2 **Recording form:** Routine Care
- 5.3 **Growth chart**
- 5.4 **Recording form:** Initial Assessment: Sick and small newborns in hospital
- 5.5 **List of abbreviations**
- 5.6 **References and contributors**

5.1 DRUG DOSAGES

- Determine appropriate drugs and dosages for baby's weight or surface area, gestational or chronological age
- Tell the mother the reason for giving the drug to the baby
- Give intra-muscular antibiotics in the antero-lateral thigh – use a new syringe and needle for each antibiotic

DRUG	DOSE	AGE / WT	FREQUENCY AND COMMENT
Abacavir	2mg/kg dose PO 8mg/kg/dose PO	< 30 days > 30 days	12 hrlly 12 hrlly
Adrenaline	0.01-0.03mg/kg(equates to 0.1-0.3ml/ kg of 1: 10 000 adrenaline) IV		Give as a rapid bolus followed by 0.9% Sodium Chloride flush. Mix 1 ml of 1:1000 adrenaline with 9ml of Saline to get 1:10000
Amikacin	15mg /kg/dose IV or IM	< 7days if < 32 weeks if > 32 weeks > 7days	36 hourly 24 hourly 24 hourly
Amoxicillin Augmentin	25 - 50 mg / kg / dose PO	< 7days 7 - 21 days:	12 hourly 8 hourly
Ampicillin	50 mg / kg / dose IV 100 mg / kg /dose IV for meningitis	<7 days: 7 - 21 days >21 days	12 hourly 8 hourly 6 hourly
AZT (Zidovudine)	> 2kg: 12mg / dose PO <2kg: 4 mg / kg / dose PO 1.5 mg / kg / dose IV	> 2kg < 2kg	12 hourly; dose is not per kg 12 hourly; dose is per kg 12 hourly, give over 1 hour
Caffeine	Load 10 mg/ kg PO once Maintenance: 2,5 - 5 mg/kg/dose PO		Once then maintenance dose 12 hours later Daily
Cefotaxime	50 mg / kg / dose slowly IV or IM	< 7 days 7 - 21 days >21 days	12 hourly 8 hourly 6 hourly
Ceftriaxone	Sepsis: 50 mg / kg / dose Meningitis: 80 mg / kg / dose IV Gonococcal Ophthalmia 50 mg/ kg/ dose IM		24 hourly 24 hourly 1 dose for Gonococcal ophthalmia Don't use with IV infusions that contain Calcium such as Neonatalyte, if IV infusion is required rather use Cefotaxime
Cloxacillin	25 – 50 mg / kg / dose IV or PO 100 mg/kg/dose for osteitis or intracranial infection	< 7 days 7 - 28 days > 28 days	12 hourly 8 hourly 6 hourly

5.1 DRUG DOSAGES (continued)

DRUG	DOSE	AGE / WT	FREQUENCY AND COMMENT
Erythromycin	12.5 mg / kg / dose PO		6 hourly Give for 14 days for Chlamydia or Pertussis
Ferrous lactate	(25 mg / ml) 0.2ml / PO	From 2 weeks of age	Daily
Flucloxacillin	25mg/kg		6 hourly
Gentamycin	5mg / kg / dose IV / IM	>32 weeks < 32 weeks	24 hourly 36 hourly
Glucagon	0.2mg / kg / dose IM / IV / SC		Single dose Give after consultation with a paediatrician and before referring the patient.
INH	10 mg / kg / dose PO daily		Give for 6 months if mother has been on TB treatment for more than 2 months
Combination TB treatment	RH (60,60)		Give 6 months of treatment if the mother has had <2 months treatment or is HIV positive Give RH for 6 months, and PZA for 2 months
Lamivudine (3TC)	2 mg / kg / dose PO 4 mg / kg / dose PO	< 7 days > 7 days	12 hourly 12 hourly
Lopinavir / Ritonavir (Kaletra)	300/75mg/m ² /PO or 16mg/4mg/kg/PO	Not before 42 weeks gestational age	12 hourly Closely monitor renal function, and for signs of CNS depression, seizures, hypotonia, and complete AV block in the first month
Metronidazole	Load 15mg/kg/IV/PO dose slowly 7.5 mg / kg / dose IV /PO		Once only 12 hourly
Naloxone	1mg/kg IV		Give IV if baby is still not breathing after bag and mask ventilation, and mom received narcotics in labour
Nevirapine (Syrup 10mg/1ml)	As post exposure prophylaxis 0.2 ml/kg/ dose PO 0.4 ml/kg/dose PO 1ml/ dose PO 1.5 ml/ dose PO 2 ml/ dose PO 3 ml/dose PO 4 ml/ dose PO	< 2kg day 0 -14 <2kg day 15- 42 2 – 2.5 kg >2.5kg >6 wks – 6mo > 6 mo – 9 mo >9 mo	After birth and daily Daily for 6 weeks Daily for 6 weeks Daily for 6 weeks Daily for the duration of breastfeeding if mom not on ART Daily for the duration of breastfeeding if mom not on ART Daily for the duration of breastfeeding if mom not on ART

5.1 DRUG DOSAGES (continued)

DRUG	DOSE	AGE / WT	FREQUENCY AND COMMENT
Nystatin	1ml (100 000u) PO		6 hourly Continue until no thrush for 3 days
Paracetamol	Load 24mg/kg 12 mg/kg/dose maintenance	Term Preterm	6 hourly 8 hourly
Penicillin G (Benzyl penicillin)	<u>Sepsis / Syphilis</u> 50 000u / kg / dose IV <u>Meningitis / Tetanus</u> 100 000u / kg / dose IV	Term Preterm < 7 days > 7 days	6 hourly 12 hourly 8 hourly <u>Duration of treatment</u> Tetanus: 5 days Syphilis: 10 days Sepsis / Pneumonia: 14 days Meningitis: 21 days
Penicillin Benzathine	50 000u/ kg / dose IM		1 dose for babies born to mothers with syphilis who are untreated or partially treated
Procaine Penicillin	50 000u/ kg/ dose IM 24 hourly		For symptomatic congenital syphilis: 10 days NEVER GIVE IV
Prostaglandin E2	¼ tablet half hourly. Crush the tablet, mix with 2-5ml of water and give it through a nasogastric tube		
Phenobarbitone	Load: 20 mg/ kg IV over 10 minutes Maintenance: 4 mg/ kg / dose orally / IV / IM / rectally		IV stat over 10 minutes 24 hourly
Phenytoin	Load: 20 mg / kg / IV over 30 minutes Maintenance: 4 - 8 mg / kg / dose		Orally / IV / rectally 24 hourly
Theophylline (oral)	Load: 6 mg / kg orally Maintenance: 2.5 mg / kg / dose		Give in pre-term infants (< 35 weeks gestational age to prevent apnoea) 12 hourly
Vitamin D2	400 iu / kg/ day PO		Daily For pre-term infants
Vitamin K	1 mg IM if < 1000g give 0.3 mg IM		At birth or as a single dose to prevent Haemorrhagic disease of the newborn Prophylaxis with oral Vitamin K is not recommended



ANTIRETROVIRAL DRUG DOSING CHART FOR CHILDREN 2019

Compiled by Child and Adolescent Committee of SA HIV Clinicians Society in collaboration with the Department of Health



	Abacavir (ABC)	Lamivudine (3TC)	Zidovudine (AZT)	Lopinavir/ritonavir (LPV/r)	Lopinavir/ritonavir when on Rifampicin (& for 2 weeks after stopping Rifampicin) Choose only one option:	* Atazanavir (ATV) + Ritonavir (RTV)	Dolutegravir (DTG)	Dolutegravir when on Rifampicin	Efavirenz (EFV)	Target dose
Target dose	8 mg/kg/dose TWICE daily OR If ≥10kg: 16 mg/kg/dose ONCE daily	4 mg/kg/dose TWICE daily OR If ≥10kg: 8 mg/kg/dose ONCE daily	180-240 mg/m ² /dose TWICE daily	300/75 mg/m ² /dose LPV/r TWICE daily	LPV/r std dose + super-boosting with Ritonavir (RTV) solution TWICE daily (≥0.75xLPV dose bd) OR LPV/r std dose + super-boosting with Ritonavir (RTV) powder TWICE daily (≥0.75xLPV dose bd) OR Double-dose LPV/r tabs ONLY if able to swallow whole LPV/r tabs TWICE daily	By weight band ONCE daily	By weight band ONCE daily	By weight band TWICE DAILY	By weight band ONCE daily	Target dose
Available formulations	Sol. 20 mg/ml Tabs 60 mg (scored, dispersible), 300 mg (not scored), FDC: ABC/3TC 600/300 mg	Sol. 10 mg/ml Tabs 150 mg (scored), FDC: ABC/3TC 600/300 mg	Sol. 10 mg/ml Tabs 100, 300 mg (not scored), FDC: AZT/3TC 300/150 mg	Sol. 80/20 mg/ml Adult tabs 200/50 mg Paed tabs 100/25 mg TABLETS MUST BE SWALLOWED WHOLE	Sol. 80 mg/ml Oral powder 100 mg/packet	Adult tabs 200/50 mg Paed tabs 100/25 mg	ATV caps 150, 200 mg RTV tabs 100 mg ATV CAPSULES AND RTV TABLETS MUST BE SWALLOWED WHOLE	ATV caps 150, 200 mg RTV tabs 100 mg ATV CAPSULES AND RTV TABLETS MUST BE SWALLOWED WHOLE	ATV caps 150, 200 mg RTV tabs 100 mg ATV CAPSULES AND RTV TABLETS MUST BE SWALLOWED WHOLE	ATV caps 150, 200 mg RTV tabs 100 mg ATV CAPSULES AND RTV TABLETS MUST BE SWALLOWED WHOLE
WL (kg)	Consult with a clinician experienced in paediatric ARV prescribing for neonates (<28 days of age) and infants weighing <3kg									
3-3.9										3-3.9
4-4.9	2 ml bd	2 ml bd	6 ml bd	* 1 ml bd	1 ml bd					4-4.9
5-5.9										5-5.9
6-6.9	3 ml bd	3 ml bd	9 ml bd			Do not use double-dose LPV/r tabs				6-6.9
7-7.9				* 1.5 ml bd	1.5 ml bd					7-7.9
8-8.9	4 ml bd	4 ml bd								8-8.9
9-9.9			12 ml bd			100 mg (1 packet) bd				9-9.9
10-10.9	Choose only one option 6 ml bd OR 12 ml od	Choose only one option 12 ml od	OR 1x100 mg tab bd	Choose only one option: 2 ml bd OR 2x100/25 mg paed tabs am + 1x100/25 mg paed tab pm	1.5 ml bd	3x100/25 mg paed tabs bd	Avoid ATV capsules when <15 kg or <6 years	Not currently recommended: dosing & formulations not available	Not currently recommended: dosing & formulations not available	1x200 mg cap/tab nocte
11-13.9	2x60 mg tabs bd	4x60 mg tabs od	6 ml bd	12 ml od	1x100 mg tab bd	2x100/25 mg paed tabs bd				11-13.9
14-14.9	8 ml bd	5x60 mg tabs od	1x150 mg tab bd	1x150 mg tab od	2x100 mg tabs am + 1x100 mg tab pm	2x100/25 mg paed tabs bd				14-14.9
15-16.9	OR 2.5x60 mg tabs bd	OR 1x300 mg tab od	OR 8 ml bd	OR 15 ml od	OR 15 ml od	OR 15 ml od				15-16.9
17-19.9										17-19.9
20-22.9	10 ml bd	1x300 mg tab + 1x60 mg tab od	1x150 mg tab bd	2x150 mg tab od	2x100 mg tabs bd	2x200/50 mg adult tabs bd				20-22.9
23-24.9	OR 3x60 mg tabs bd	OR 1x300 mg tab + 2x60 mg tabs od	OR 15 ml bd	OR 30 ml od	OR 20 ml bd	OR 20 ml bd				23-24.9
25-29.9					Choose only one option: 3.5 ml bd OR 3x100/25 mg paed tabs bd OR 1x200/50 mg adult tab bd + 1x100/25 mg paed tab bd	3 ml bd	1x200 mg cap od + RTV 1x100 mg tab od	1x50 mg tab od	1x50 mg tab bd	2 x 200 mg caps/tabs nocte
30-34.9	1x300 mg tab bd	OR 1xABC/3TC 600/300 mg tab od	OR 1x150 mg tab bd	OR 1x150 mg tabs od	OR 1x300 mg tab bd	OR 300 mg (3 packets) bd				25-29.9
35-39.9					Choose only one option: 5 ml bd OR 4x100/25 mg paed tabs bd OR 2x200/50 mg adult tabs bd	4 ml bd	3x200/50 mg adult tabs bd			30-34.9
>40						400 mg (4 packets) bd	ATV 2x150 mg caps od + RTV 1x100 mg tab od	1x50 mg tab od OR FDC: TLD if eligible od	1x50 mg tab bd OR FDC: TLD if eligible od + 50 mg 12 hours after TLD dose	1x600 mg tab nocte OR FDC: TEE if eligible od

Avoid LPV/r solution in any full-term infant <14 days of age and any premature infant <42 weeks post conceptual age (corrected gestational age) or obtain expert advice.
 Children weighing 25-29.9 kg may also be dosed with LPV/r 200/50 mg adult tabs: 2 tabs am + 1 tab pm.
 * Atazanavir + Ritonavir should not be used in children/adolescents on treatment with Rifampicin, obtain expert advice.
 No dosage adjustments are required for children receiving treatment with Efavirenz and Rifampicin.

od = once a day; nocte = at night; bd = twice a day; am = in the morning; pm = in the evening; std = standard; FDC = fixed dose combination; TLD = tenofovir/lamivudine/dolutegravir; TEE = tenofovir/emtricitabine/efavirenz

Weight (kg)	3-5.9	6-13.9	14-24.9	≥25
Cotrimoxazole Dose	2.5 ml od	5 ml or ½ tab	10 ml or 1 tab	2 tabs od
Multivitamin Dose	2.5 ml od	2.5 ml od	5 ml od	10 ml od

ARV DOSING CHART FROM BIRTH TO 28 DAYS OF AGE[‡]

Birth weight ≥ 2.5 kg and gestational age ≥ 35 weeks*

	Lamivudine (3TC)		Zidovudine (AZT)		Nevirapine (NVP)	
Target dose	2 mg/kg/dose TWICE daily (BD)		4 mg/kg/dose TWICE daily (BD)		6 mg/kg/dose TWICE daily (BD)	
Available formulation	10mg/ml		10mg/ml		10mg/ml	
Weight (kg)	Dose in ml	Dose in mg	Dose in ml	Dose in mg	Dose in ml	Dose in mg
≥ 2.5 - <3	0.5 ml BD	5 mg BD	1 ml BD	10 mg BD	1.5 ml BD	15 mg BD
≥ 3 - <4	0.8 ml BD	8 mg BD	1.5 ml BD	15 mg BD	2 ml BD	20 mg BD
≥ 4 - <5	1 ml BD	10 mg BD	2 ml BD	20 mg BD	3 ml BD	30 mg BD

- Dosing is based on the birth weight of the child. It is not necessary to change the dose before 28 days of age if for example if the weight decreases in the first week or two of life.
- Caregivers administering ARV medication to the child must be supplied with a syringe (2 ml or 5 ml) for each of the 3 ARVs and shown how to prepare and administer the prescribed dose. If required, bottles and syringes should be colour coded with stickers and a sticker of the relevant colour used to mark the correct dose on the syringe.

[‡]Refer to the protocol for initiation of ART in HIV-infected neonates in the NDOH 2019 ART Clinical Guidelines which includes guidance on ARV management after 28 days of age
*Consult with a clinician experienced in paediatric ARV prescribing or the National HIV & TB Health Care Worker Hotline for neonates with birth weight <2.5 kg or gestational age <35 weeks

PRACTICAL ADVICE ON ADMINISTRATION OF ARV DRUGS

ARV Drug	Formulations (as used in dosing chart)	Can tablets be split/crushed if unable to swallow?	Comment
Abacavir (ABC)	Oral solution: 20 mg/ml Tablets: 60 mg, 300 mg FDC tablet: ABC/3TC 600/300 mg	Tablets: YES Limited data on FDC, preferably swallow whole or use individual drugs.	Hypersensitivity reaction (fever, rash, GIT & respiratory symptoms) may occur during first 6 weeks of therapy, very uncommon in black African patients. Symptoms typically worsen in the hours immediately after the dose and after each subsequent dose. Caregivers or patients should discuss symptoms early with the clinician rather than stopping therapy. Stop ABC permanently if hypersensitivity reaction has occurred.
Lamivudine (3TC)	Oral solution: 10 mg/ml Tablets: 150 mg, FDC tablets: ABC/3TC 600/300 mg, TLD 300/300/50 mg	Tablets & FDC: YES	Well tolerated, adverse-effects uncommon. Pure red cell aplasia causing anaemia can occur but is very rare.
Zidovudine (AZT)	Oral solution: 10 mg/ml Tablets: 100 mg, 300 mg Capsules: 100 mg FDC tablet: AZT/3TC 300/150 mg	Capsules: YES. Open and add to a small amount of soft food/liquid and ingest immediately.	Avoid or use with caution in neonates or children with anaemia (Hb <8 g/dl) due to potential to cause bone marrow suppression.
Tenofovir (TDF)	Tablets: 300 mg FDC tablets: TDF/FTC 300/200 mg, TEE 300/200/600 mg, TDF/3TC/EFV 300/300/600 mg, TLD 300/300/50 mg	Data is lacking; preferably swallow whole or use individual drugs.	TDF may be prescribed for adolescents ≥ 10 years of age AND ≥ 35 kg body weight after ensuring adequate renal function by checking eGFR/creatinine using the appropriate formula (refer to 2019 ART Clinical Guidelines). TDF is usually prescribed as part of an FDC tablet: TDF/FTC, TDF/FTC/EFV, TDF/3TC/EFV or TDF/3TC/DTG. To assess for TDF-induced nephrotoxicity, do creatinine and eGFR at months 3, 6 and 12 and thereafter repeat every 12 months.
Lopinavir/ritonavir (LPV/r)	Oral solution: 80/20 mg/ml Tablets: 200/50 mg, 100/25 mg	Tablets: NO Must be swallowed whole and not divided, crushed or chewed.	Oral solution should be refrigerated/stored at room temperature (if $<25^{\circ}\text{C}$) for up to 6 weeks. Preferably administer oral solution with food as increases absorption. Strategies to improve tolerance and palatability of oral solution: coat mouth with peanut butter, dull taste buds with ice, follow dose with sweet foods. Many drug-drug interactions. [‡]
Ritonavir (RTV)	Oral solution: 80 mg/ml Oral powder: 100 mg/packet Tablets: 100 mg	Must be swallowed whole and not divided, crushed or chewed.	Ritonavir oral solution should be stored at room temperature, shelf-life is approximately 6 months. Strategies to improve tolerance and palatability of oral solution: coat mouth with peanut butter, dull taste buds with ice, follow dose with sweet foods. Each 100 mg packet of RTV powder should be mixed with a small amount of water or soft food and immediately ingested. Many drug-drug interactions. [‡]
Atazanavir (ATV)	Capsules: 150 mg, 200 mg	Capsules: NO Must be swallowed whole and not divided, crushed or chewed.	ATV is used in combination with RTV which must be dosed separately as a co-formulation is not available. May cause unconjugated hyperbilirubinaemia resulting in jaundice but this does not indicate hepatic toxicity and not a reason to discontinue the drug unless it is worrying the patient. Consider drug-drug interactions. [‡]
Dolutegravir (DTG)	Tablets: 50 mg FDC tablet: TLD 300/300/50 mg	Tablet: YES Data on crushing FDC tablet is lacking; swallow whole or use individual drugs.	Iron supplements decrease DTG concentrations if taken together on an empty stomach. To prevent this, DTG and iron supplements can be taken at the same time if taken with food. May be helpful to administer as a morning dose rather than an evening dose if insomnia occurs with evening dosing. May raise creatinine levels by up to 15% without affecting renal function. Consider drug-drug interactions. [‡]
Efavirenz (EFV)	Capsules: 50 mg, 200 mg Tablets: 50 mg, 200 mg, 600 mg FDC tablet: TEE 300/200/600 mg	Tablets: NO Must be swallowed whole and not divided, crushed or chewed. Capsules: YES. Open and add to small amount of soft food and ingest immediately.	Best given at bedtime to reduce CNS side-effects, especially during first 2 weeks. Consider drug-drug interactions. [‡]

FDC = fixed dose combination; eGFR = estimated glomerular filtration rate; GIT = gastrointestinal tract; TEE = Tenofovir/emtricitabine/efavirenz; TLD = Tenofovir/Lamivudine/Dolutegravir

EML-Antiretroviral interactions table (<http://www.mic.ac.za/drug-interactions>) OR the Liverpool HIV iChart application for smart phones, or any of the helplines: National HIV and TB Health Care Worker Hotline: 0800 212 506 or Right to Care Paediatric and Adolescent HIV Helpline: 082 352 6642 and KZN Paediatric Hotline: 0800 106 603



NEED HELP?
Contact the TOLL-FREE National HIV & TB Health Care Worker Hotline at
0800 212 506 / 021 406 6782
Alternatively "whatsapp" or send an SMS or "Please Call Me" to 071 840 1572



5.2 RECORDING FORM: ROUTINE CARE

Infants Name: _____

Birth Time: _____

Hospital Number: _____

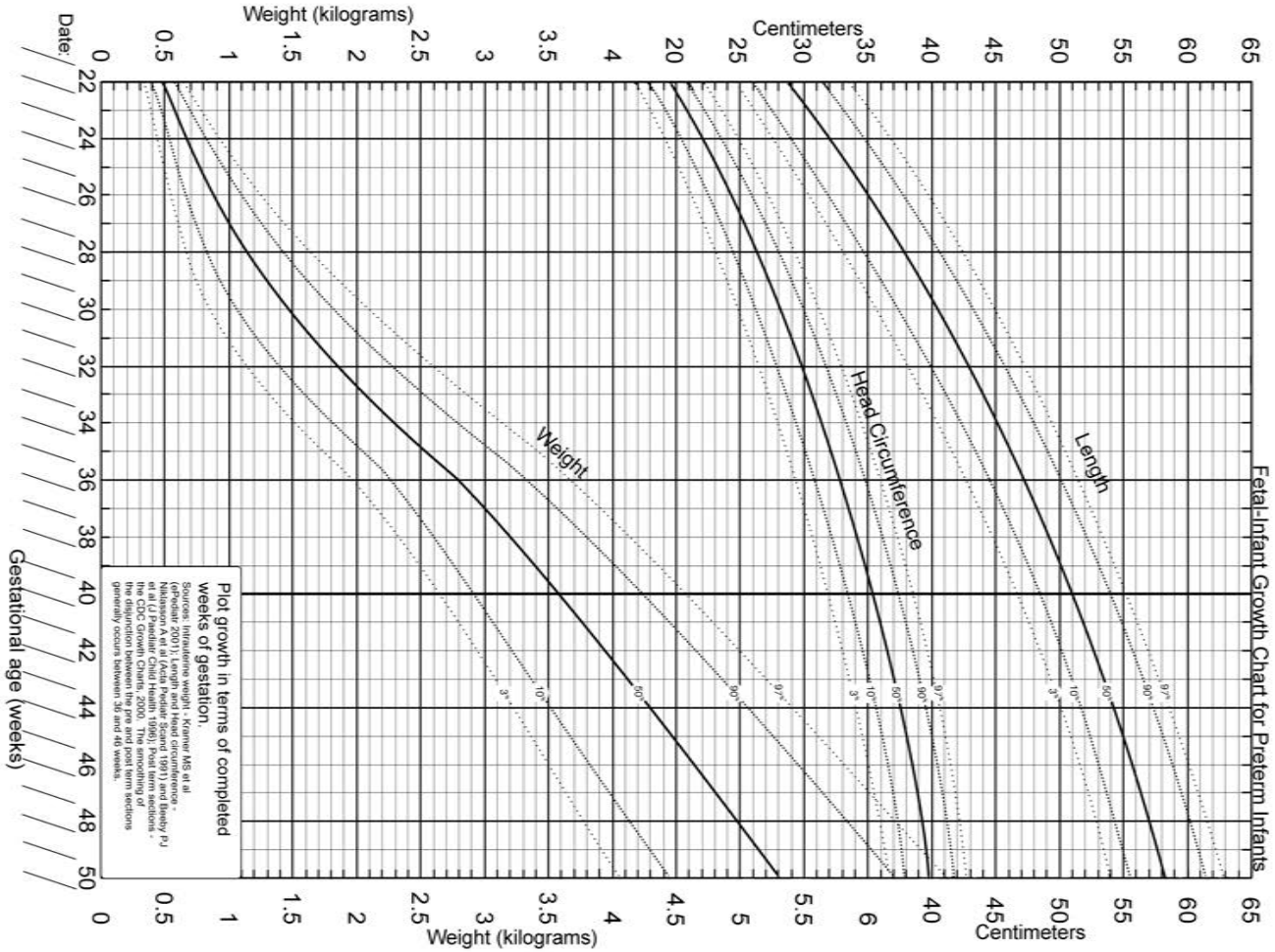
Birth Date: _____

Gender:	Birth Weight: kg	HC: cm	Gest Age Score: weeks	Resuscitation:(Circle)		
				None	Bag and Mask	Advanced
Apgar Score	0	1	2	1 min	5 min	Details of resuscitation:
Heart rate	Absent	< 100 / min	> 100 / min			
Respiration	Absent	Slow or irregular	Good, crying			
Muscle Tone	Limp	Slight flexion	Active, moves			
Response to stimulation	No response	Grimace	Vigorous cry			
Colour	Blue or pale	Body pink, limbs blue	Pink all over			
Total:						
Mode of delivery <input type="checkbox"/> NVD <input type="checkbox"/> C/S <input type="checkbox"/> Vac <input type="checkbox"/> Forceps				Routine care:	Treatment given:	Date done:
<u>Problems with delivery:</u>				Eye care:		
Placenta: _____ wt: _____				Vitamin K 1mg imi:		
Risk factors to baby:						
Pregnancy:		Care required:		Care received:		Date done:
RPR positive	<input type="checkbox"/> No <input type="checkbox"/> Yes	Examine, Benzathine Pen if mother incompletely treated				
RPR unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes	Examine, Benzathine Penicillin to baby if no result				
Blood Rh neg or group O	<input type="checkbox"/> No <input type="checkbox"/> Yes	Check the TSB at 6 hours				
HIV positive	<input type="checkbox"/> No <input type="checkbox"/> Yes	Nevirapine for 6 weeks, then reassess based on care mother is receiving and feeding				
HIV unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes	Arrange HIV testing for mother, if positive, as above				
TB status	<input type="checkbox"/> No <input type="checkbox"/> Yes	If mom has TB provide prophylaxis or treatment to baby				
Maternal diabetes	<input type="checkbox"/> No <input type="checkbox"/> Yes	Refer to nursery for hourly blood sugars for the first 6 hours				

5.2 RECORDING FORM: ROUTINE CARE (continued)

LABOUR:				
MSL	<input type="checkbox"/> No <input type="checkbox"/> Yes	Assess baby for respiratory distress		
Foetal distress	<input type="checkbox"/> No <input type="checkbox"/> Yes	Assess baby for Neonatal Encephalopathy		
PROBLEMS DURING NEWBORN PERIOD:			Preventive care:	
1			Polio:	
2			BCG:	
3			RTH Booklet filled in:	
FEEDING:			Follow up Plans:	
Did mother breastfeed baby within 1 hour of birth	<input type="checkbox"/> No <input type="checkbox"/> Yes	In first week:	Date:	Place:
Has mother been counselled on the benefits of breastfeeding	<input type="checkbox"/> No <input type="checkbox"/> Yes	At 6 weeks:	Date:	Place:
		For PCR:	Date:	Place:
Feeding on discharge?		Discharge weight:		Discharge date:
Identification:				
At Birth	Date:	Midwife (print)	Mother (print)	Witness:
Postnatal Ward	Date:	Brought by:	Received by:	Mother:
At Discharge	Date:	Midwife (print)	Mother (print):	Witness:

5.3 GROWTH CHART



5.4 RECORDING FORM: INITIAL ASSESSMENT: SICK AND SMALL NEWBORNS IN HOSPITAL

Date of Assessment:	Time of Assessment:	Baby's Name:
Date of birth:	Birth Weight:	Place of Birth:
What is the reason for admission:		

Circle the positive findings, then circle the classification and ACT.

Assess the need for emergency care		Abnormal signs			CLASSIFY	ACT NOW
Breathing?	Breathing well	Gaspings	Resp rate < 20		Respiratory failure	
Circulation?	HR 120 - 180	Pale / cold	HR > 180	HR < 100	Circulatory failure	
		Lethargic	Unconscious			
Check Glucose?	> 2,5 mmol/l	1,4-2,5mmol/l	<1,4mmol/l		Hypoglycaemia	
Assess for priority signs: Apnoea and Respiratory Distress						
Respiratory distress?	RR < 60	Apnoea	RR 60 - 80	RR > 80	Apnoea	
	Mild chest indrawing	Severe Chest In-drawing	Grunting	Cyanosis	Severe Resp D	
					Mild Resp D	
					Possible heart abn	

5.4 RECORDING FORM: INITIAL ASSESSMENT: SICK AND SMALL NEWBORNS IN HOSPITAL

Assess for priority signs		Abnormal signs			CLASSIFY	ACT NOW	
Temperature:	36 – 37,5 oC	32 – 35,9	< 32 oC	> 37,5	Hypothermia		
Birth weight:	2,50 – 3,99kg	2,0 – 2,49kg	1,0 – 1,49kg	1,5 – 1,99kg	Severe disease		
			<1,0kg		ELBW < 1kg		
Tone, fontanel and movement	Normal	Decreased tone	Increased tone	Full fontanelle	VLBW 1 – 1,49 kg		
	Normal movement	Reduced movement	Irregular jerky movements	Convulsions	LBW 1,5 – 1,99kg		
Abdominal Signs & jaundice		Jaundice	Abdominal distension	Vomiting bile	LBW 2 – 2,5kg		
					Jaundice		
					Other:		
Assess for injuries, abnormalities and local infections							
Head, face and ears:	Normal Head circumference	Head circ. < 3rd centile	Head circ > 97th centile (39cm)	Sutures splayed	Neural tube defect		
	Sutures normal	Boggy swelling scalp	Unusual appearance:		Major abdominal problem		
Mouth and nose:	Nose patent	Cleft lip	Cleft palate	Nose not patent	Hydrocephalus		
		Other Abnormality:			Ambiguous genitalia		
Eyes:	Normal	Eyelid red and swollen:	Pus draining from eyes	Other:	Microcephaly		
Abdomen and back:	Anus patent	Imperforate anus	Neural Tube defect		Club foot		
	Meconium passed:	Mec not passed in 24 hours	Omphalocele	Gastroschisis	Cleft lip or palate		
Genitalia:	Male Female	Ambiguous genitalia			Other major cong abnormality		
Skin and umbilicus:	Normal	Pustules / rash	Umbilicus red / pussy discharge	Other:	Other minor abnormality:		
Limbs :	Moving normally	Club foot	Not moving limb / pain when moved	Abnormal position	Limb injury		
		Extra digit	Other:		Staph skin sepsis		
					Omphalitis		
					Severe conjunctivitis		
					Mild conjunctivitis		

Assess risk factors and special treatment needs		Abnormal signs			CLASSIFY	ACT NOW
Maternal diabetes	None	Baby weighs > 4500g	Maternal diabetes		Risk of Hypoglycaemia Jaundice Bacterial infection Neonatal encephalopathy Congenital syphilis HIV transmission Tuberculosis	
Maternal blood group	A / B / AB positive	Unknown	Blood group O	RH negative		
Amniotic fluid infection	None	ROM > 18 hours	Maternal fever or uterine infection	Offensive liquor		
Labour and delivery	Normal, Apgars 9 or 10	Apgars < 8	> 5 minutes to spontaneous breath	Other:		
Maternal RPR	Negative	Positive fully treated	Positive partially treated	Unknown		
Maternal HIV	Negative	Positive	Duration on ART:	Last VL: Date:		
Maternal TB	Negative	Mother coughing	TB on treatment >2months	TB on treatment < 2 months		
Feeding						
Breast feeding	Breast feeding	Other:	Poor feeding	Cannot feed		

Examined By:	Time:	Date:
---------------------	--------------	--------------

Identification	Date:	Time:	Brought by:	Signature:	Received by:	Signature:
At Birth:						
Neonatal Unit:						
Other:						
At discharge:						

5.5 LIST OF ABBREVIATIONS

APH	Antepartum haemorrhage	IVH	Intra-ventricular haemorrhage
AIDS	Acquired immunodeficiency syndrome	KMC	Kangaroo mother care
AFIS	Amniotic fluid infection syndrome	LBW	Low birth weight
AGA	Appropriate for gestational age	LP	Lumbar puncture
ANC	Antenatal care	NEC	Necrotizing enterocolitis
ARV	Anti-retroviral	NG	Naso-gastric
AZT	Zidovudine	NMR	Neonatal mortality rate
CA	Chorio – amnionitis	NND	Neonatal death
CHD	Congenital heart disease	NNU	Neonatal Unit
CNS	Central nervous system	NICU	Neonatal Intensive Care Unit
CPAP	Constant positive airway pressure	NTD	Neural tube defect
CRP	C-reactive protein	NVP	Nevirapine
CXR	Chest X-ray	PCR	Polymerase chain reaction test
EBM	Expressed breastmilk	PDA	Patient ductusarteriosus
EBF	Exclusive breast feeding	PMTCT	Prevention of mother to child transmission
FBC	Full blood count	PROM	Prolonged rupture of membranes
GA	Gestational age	RDS	Respiratory distress
GPH	Gestational proteinuric hypertension	RPR	Rapid plasma reagin (syphilis)
HIE	Hypoxic-ischaemic encephalopathy	ROM	Rupture of membranes
HIV	Human immune deficiency virus	RR	Respiratory rate
HMD	Hyaline membrane disease	RTHC	Road to health card
HR	Heart rate	TPN	Total parental nutrition
ICU	Intensive care unit	TSB	Total serum bilirubin
IDM	Infant of diabetic mother	TSR	Time to sustained respiration
IM	Intramuscular injection	VCCT	Voluntary confidential counselling and testing
IPPV	Intermittent positive pressure ventilation	VCT	Voluntary counselling and testing
IV	Intravenous injection		
IVF	Intravenous fluids		

5.6 REFERENCES AND CONTRIBUTORS

1. Standard Treatment Guidelines and Essential Drugs List for South Africa: Hospital Level paediatrics. National Department of Health, South Africa, 2013
2. Horn AR, Kirsten GF, et al Phototherapy and exchange transfusion for neonatal hyperbilirubinaemia S. Afr. Med. J 2006; 96: 819 - 824
3. Thompson MC, Puterman AS, et al. The value of a scoring system for hypoxic ischaemic encephalopathy in predicting neuro-developmental outcomes. Actapaediatr 1997; 86: 757 - 761
4. McCormick M.(ed.) Managing Newborn Problems: A guide for doctors, nurses, and midwives. 2003 WHO
5. Woods DL.(ed.) Perinatal Education Programme: Newborn Care Perinatal Education Trust
6. Integrated Management of Childhood Illness: South African Adaptation 2011 and 2013
7. 2019 PMTCT guidelines, including provisional guidelines for premature infants
8. ARV guidelines and doses: personal communication Prof Coovadia and Dr L, Levin
9. Horn, AR, Neonatal Drug doses and normal values
10. Helping Babies Breathe, American Academy of Paediatrics 2nd Ed.

These newborn care charts have been developed by the Limpopo Initiative for Newborn Care, University of Limpopo and Department of Health, Limpopo Province. We would like to acknowledge the Centre for Rural Health, Save the Children Fund and UNICEF and the National Department of Health for their support.

CONTRIBUTORS

Dr Anne Robertson
Prof Atties Malan
Dr Dave Greenfield
Ms Lolly Mashao
Dr Natasha Rhoda
Dr Ameena Goga
Ms Kate Kerber
Dr Joy Lawn

REVIEWERS

Prof Dave Woods
Dr Mark Patrick
Ms Zo Mzolo
Dr Mike English
Dr Steven Wall
Dr Mike English
Dr Gonzolo Mansilla
Dr Rienk Baarsma
Dr Kenny Hamese
Dr Chris Sutton
Dr Lesley Bamford
Dr Francois Bonnici
Ms Anne Behr
Ms Veliswa Mgudlwa

CONTRIBUTORS TO THE UPDATED GUIDELINES

The updated version of the guidelines was made possible by the valuable contributions of the following:

Rienk Baarsma
Thomas Mailula
Patrick Shibambu
Lolly Mashao
Melanthe Coetzee
Jeroen Lobenstein
Ute Feucht
Anne Robertson-Sutton
Ntondeni Ravuluvulu
Rose Seopa
Glenrose Rikhotso
Mbilaelo Tshamiswe

