MATURETNY & NEONATAL UNIT
GUIDELINE:

MANAGEMENT OF INFANTS BORN WITH MECONIUM STAINED AMNIOTIC FLUID AND MECONIUM ASPIRATION

SCOPE:
All midwives and nurses working in Maternity and the NNU

AUTHOR:
NNU Quality Coordinator

PURPOSE:
To provide optimum management for infants born with meconium stained amniotic fluid.

DEFINITIONS:
Meconium is a thick, black-green, sterile, odourless material found in the infants gut from the third month of gestation. Meconium results from the accumulation of debris, including cells from the intestine and skin, lanugo hair, fatty material from vernix caseosa, amniotic fluid and intestinal secretions.

Meconium Aspiration syndrome (MAS) is a respiratory disorder caused by the inhalation of meconium in the amniotic fluid into the tracheobronchial tree. Aspiration can occur before, during or after birth. Most cases of severe MAS result from intrauterine processes of chronic asphyxia and infection. Persistent Pulmonary Hypertension (PPHN) frequently accompanies severe MAS and contributes to hypoxaemia.

GUIDELINE:
Meconium stained amniotic fluid is seen in approximately 14% of births. It occurs more frequently in infants who are post mature or small for gestational age.

The passage of meconium prior to birth can be a normal physiological event. It can also occur due to hypoxia which causes increased peristalsis and relaxation of the anal sphincter.

Meconium in the amniotic fluid can be aspirated during fetal gasping or the initial breaths after birth. Normally fetal breathing results in movement of lung fluid in the trachea. However, if the fetus is hypoxic then fetal breathing and gasping will be stimulated.

If meconium is aspirated into the lung it can cause mechanical blockage of small airways and cause a chemical irritation by the meconium particles, inactivation of surfactant and pulmonary vasoconstriction.
Thick meconium in amniotic fluid may occur during breech vaginal births.

Studies have shown that approximately 11% of infants with meconium stained amniotic fluid will develop meconium aspiration syndrome. It occurs more frequently in infants who are post mature or small for gestational age.

PRIOR TO BIRTH
Because the passage of meconium can be associated with fetal distress, continuous CTG monitoring is recommended in labour (RANZCOG 2016) particularly in pregnancies thought to be higher risk for intrapartum fetal distress (e.g. post maturity, intrauterine growth restriction, and pre-eclampsia).

The LMC/core midwife or obstetrician will assess ante and intra partum risk factors.

The LMC/core midwife should ensure that staff skilled in neonatal resuscitation, whose only responsibility is management of the newborn, are available at the birth.

The paediatrician should be requested to attend the birth if indicated by meconium stained amniotic fluid and fetal compromise (see Referral of inpatient neonates to pediatric service guideline).

The LMC/core midwife or obstetrician should discuss concerns directly with the pediatrician prior to the birth during day time hours if possible.

AT BIRTH
• There is no evidence that routine oro and pharyngeal suctioning as the head delivers, and prior to the delivery of the shoulders, improves outcomes for infants with meconium stained amniotic fluid. Recent studies showed no reduction of severe MAS with early routine suctioning.
• If the baby is vigorous at birth (heart rate >100, spontaneous breathing and reasonable tone) intubation and tracheal suction are not indicated. The baby should have routine care and close observation of breathing, activity and colour.
• If the baby has absent or depressed respirations, depressed muscle tone and a heart rate <100 swiftly remove as much meconium as possible from the airway by suctioning with a Size 12Fr/Ch flexible yankaeur under direct vision. The baby would not be vigorously stimulated until as much meconium as possible has been suctioned.
• Proceed with resuscitation
• Consider intubation and suctioning via ET tube with large bore suction catheter FG 10 or 8 depending on ET tube size if appropriately skilled staff are present.
• AVOID spending an extended period of time on suctioning and intubating. The baby needs positive pressure ventilation and oxygen.
If the infant has absent or severely depressed respirations at birth and is not responding to suctioning and initial resuscitation, ask for the Paediatrician to be called urgently (if not already attending the birth). Call 777 and initiate a crash team call and in addition specifying the need for a Paediatrician also. Summon assistance from a colleague skilled in resuscitation as the Paediatrician may take up to 30 minutes to arrive out of hours.

- **Infants who have required resuscitation in the presence of meconium stained fluid should be admitted to NNU.**
- Cord blood should be obtained for blood gas analysis

**FOLLOWING THE BIRTH**

*If the baby is well following birth -*

All infants with meconium stained liquor must be closely observed following birth for any signs of respiratory distress. The chemical irritation caused by aspiration of meconium causing inflammation is apparent 24 - 48 hours after inhalation. It is therefore essential to maintain close observation of the infant. *Temperature and respirations should be recorded on an infant observation chart at age 1 hour and subsequently 3 – 4 hourly for the first 24 hours of age minimum.*

Early discharge is contraindicated. If parents insist on discharge then A *Discharge against medical advice* form should be completed and signed.

If the baby develops tachypnoea with a respiratory rate greater than 60/min or respiratory distress or temperature instability, the baby should be immediately referred to the neonatal team.

Management in NNU will consist of:
- Assessment and informing a paediatrician
- Maintaining adequate oxygen saturations
- Use of CPAP to manage respiratory distress and oxygen requirement
- Minimal handling to avoid agitation and exacerbation of PPHN
- Subsequent management as ordered by the Paediatrician

**COMPLICATIONS OF MECONIUM ASPIRATION**

Meconium aspiration can interfere with normal breathing by several mechanisms. They include airway obstruction, chemical irritation, infection and surfactant inactivation. The main complications are

- Infection - meconium aspiration can lead to secondary infection
- Respiratory distress
- Pneumothorax - airway obstruction caused by meconium particles can cause “ball valve” effect
Sponsor: Women, Child and Youth
Name: Management of infants born with meconium stained amniotic fluid

- Respiratory failure
- Persistent Pulmonary Hypertension

ASSOCIATED DOCUMENTS:
Maternal Child and Youth Guideline - *Referral of inpatients to the paediatric service* June 2006

REFERENCES:
Uptodate online updated August 2016) downloaded 17/11/2016
New Zealand Resuscitation Council Guideline 13.4 2016

Date of Approval: 10/01/2017
Next Review Date: 10/01/2020