Lung Health
The Ottawa Hospital

Ottawa EPIQ team
Brigitte Lemyre, Melissa Faulkner, Emily Reuvers, Manon Boileau,
Darine El Chaar, Sarah Lawrence

EPIQ
Evidence-based Practice for Improving Quality

Lung health: changes in practice 2019-2020

1. Implementation of MIST

- Using 16G Angiocath and premedication
- With BLES 5 ml/kg
- Required training on mannequin first
- Implemented for infants ≥29 weeks GA

Implementation of MIST

INCLUSION CRITERIA:

- Spontaneously breathing neonate with a GA ≥ 29 weeks*
- < 72h
- On NIPPV or nCPAP with a PEEP ≥ to 7cmH2O
- FiO2 of 0.30 to 0.40
- Chest radiograph or clinical features consistent RDS
- Good respiratory drive (40 to 60 breaths per minute) and clinically well apart from the respiratory distress

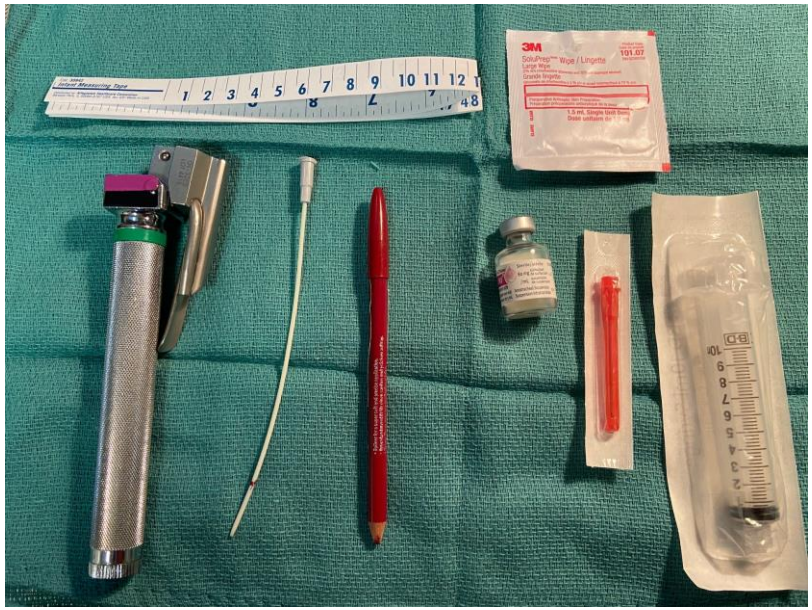
Implementation of MIST

EXCLUSION CRITERIA:

* Poor respiratory drive and/or frequent apneas
* Hemodynamically unstable post NRP (hypotension, sepsis)
* Major congenital anomalies
* Respiratory compromise that requires I & V

Equipment

* Sterile green OR towel
* Laryngoscope with appropriate size blade
* Marker pen
* Tape measure
* BD Angiocath 16G, 1.7 x 133 mm
* 10 ml syringe
* 18- or 19-gauge needle
* Alcohol swabs



Implementation of MIST

Appendix C - Premedication

Gestational age	Premedication
Less than 29 weeks	Sucrose 24% according to policy Atropine 20 mcg/kg IV Optional: fentanyl 0.5-1 mcg/kg over 3-5 minutes OR ketamine 1 mg/kg over 2 minutes
29 weeks or greater	Sucrose 24% according to policy Atropine 20 mcg/kg IV Fentanyl 1 mcg/kg over 3-5 minutes OR Ketamine 1 mg/kg over 2 min

Audit results MIST

* 23 procedures performed x March 1 2020
* 27-36 weeks; 22/23 with BLES
* Number of attempts:
  * 1 attempt 13/23 (57%)
  * 2 attempts 7/23 (30%)
  * 3 attempts 3/23 (13%)

Audit results MIST

* 6/23 (26%) required intubation and 2nd dose of surfactant
* 10/23 (43%) had a desaturation, apnea or chest freeze
* Reduced dose of fentanyl and added ketamine as an alternative or first choice
* Team remains enthusiastic towards procedure

Lung health: changes in practice 2019-2020

2. Changes to ventilation protocol

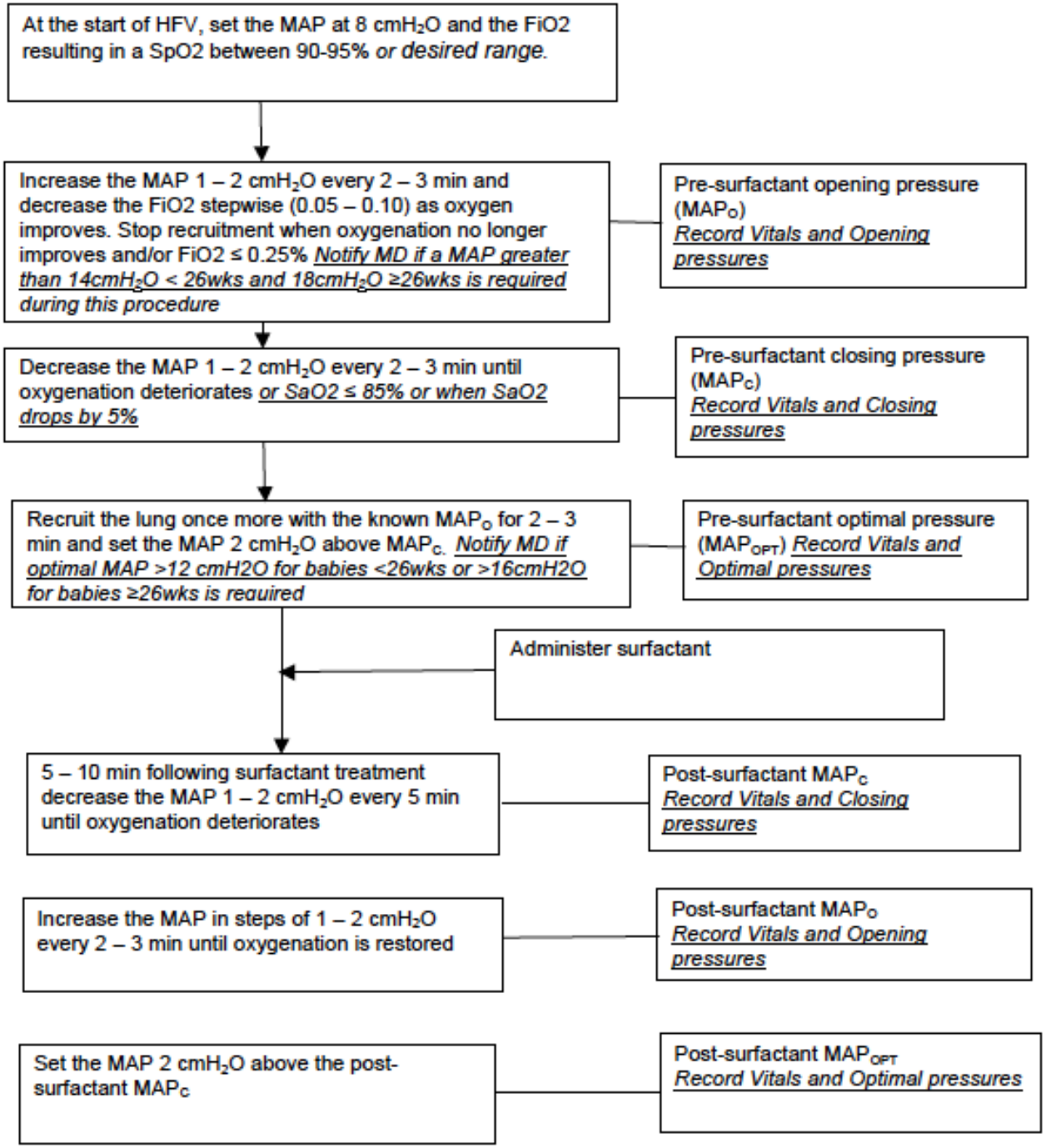
- Use of HFOV with VG for all < 26 weeks GA and requiring invasive respiratory support
- Defined criteria to go from CMV to HFOV: based on PIP required to reach VT
- Determination of ideal MAP prior to receipt of surfactant (Van Kaam)
- Ongoing audits: hyperinflation, hyperventilation, days on MV, BPD

Recommended initial tidal volume (VT) and Peak pressures.

Condition	Initial Vt	Initial PIP limit	Rationale
Term, late preterm, normal lungs	4-4.5 ml/kg	18 cm H20	Baseline/normal compliance
Preterm RDS <700g	5.5-6 ml/kg	24 cm H20	Dead space of the flow sensor / decreased compliance, risk of air leak
Preterm RDS 700-1249g	4.5-5 ml/kg	24 cm H20	Dead space of the flow sensor / decreased compliance, risk of air leak
Preterm RDS 1250-2500g	4-4.5 ml/kg	26 cm H20	Low alveolar dead space/decreased compliance
Preterm evolving BPD, 3 weeks old	5.5-6.5 ml/kg	26 cm H20	Increased anatomical and alveolar dead space/worsening compliance
Established severe BPD	6-8 ml/kg	30 cm H20	Greatly increased alveolar and anatomical dead space; lower respiratory rate due to long time constants, needs larger VT
Sick term lungs	4.5-5 ml/kg	25 cm H20	Increased anatomical and alveolar dead space/worsening compliance
Term MAS with classic CXR	5.5-6 ml/kg	28 cm H20	Increased alveolar dead space/poor compliance
Term MAS with white out CXR	4.5-5 ml/kg	30 cm H20	Alveolar dead space less of a problem/very poor compliance

Keszler M. Arch Dis Child Fetal Neonatal Ed 2018;0:F1–F5. doi:10.1136

Lung recruitment maneuver:



Lung health: changes in practice 2019-2020

3. Prophylactic hydrocortisone

- Premiloc protocol:
  - 0.5 mg/kg q 12h x 7 days, then 0.5 mg/kg daily x 3 days
- For all infants born < 28 weeks
- Implementation Sept 1 2019
- Outcomes of interest:
  - BPD free survival
  - Late-onset sepsis
  - SIP

22-27 weeks	Jan-Dec 2018	Sept 2019 – June 2020
BPD	67%	48%
Moderate-severe BPD	30%	25%
LOS	17%	15%
SIP	1.6% (1/61)	8.8% (3/34)

Site Visits in 2020

Contact Information

Brigitte Lemyre, blemyre@toh.on.ca