# BUBBLE CPAP FOR ACUTE RESPIRATORY FAILURE IN NEONATES AND YOUNG PAEDIATRICS

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RECONNECTING RURAL

# CREDIT WHERE IT'S DUE

- Belinda Coulter
  - Lakes dhb Paediatrician
- Nigel Bryant
  - Flight paramedic, search and rescue services
- Robin Chan
  - Publicity feature
- Taupo rural SMO group
- COVID and mitre 10 solutions

# DISCLAIMER

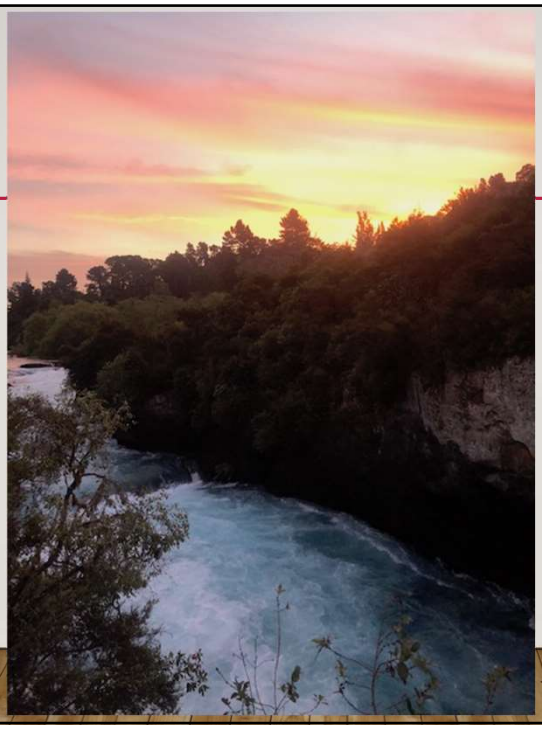
- The only bubble CPAP unit in Taupo

# OVERVIEW

- Taupo experience
  - Nurse practitioner, colocation, bubble CPAP, local paeds ownership
- A bit of physiology
- Prehospital innovation
- Our protocol
- Our unit

# HISTORY

- Taupo 2009
  - Separate localities for birthing
  - Mostly locum clinical workforce
  - Snow
  - Poor outcomes
- Solution
  - Colocation of maternity services with ED
  - Transition to rural hospital model and rural generalist clinicians
  - Increased collabaration of LMC/Paediatrician/Obstetrician/RH doctors/nurse practitioners



# WHY

- Acute respiratory failure is a major cause of neonatal and paediatric mortality and morbidity
- Alveolar hypoventilation and ventilation / perfusion mismatch = hypoxaemia
- CPAP / NIV
  - Reduces work of breathing
  - Improves gas exchange
  - Reduces need for intubation
  - Improves survival

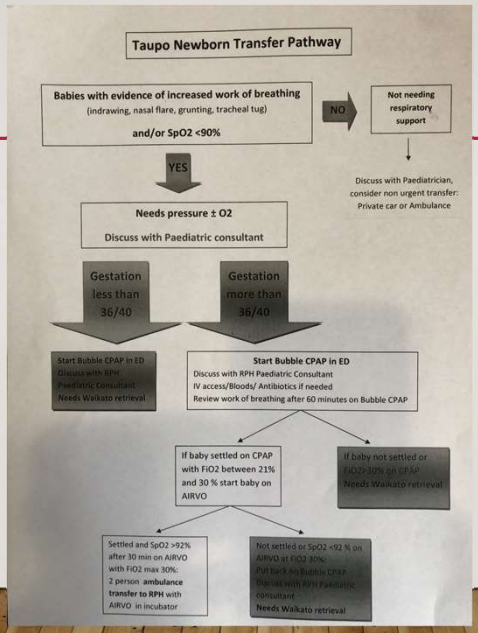
# WHAT

- Continuous flow into pharynx
- Increased pharyngeal pressure on exhalation
- =/- oxygen rich inhalation

- Distal end of circuit immersed in water determines resistance to exhalation

# WHO

- Neonates and paediatrics <5 years with respiratory distress
  - Sats <95%
  - Tachypnoea
  - Accessory muscle use
  - grunting
- Contraindications
  - Cardiorespiratory arrest
  - GCS<14
  - Asthma
  - Inability to maintain airway


Taupo Newborn Transfer Pathway
Babies with evidence of increased work of breathing
(indrawing, nasal flare, grunting, tracheal tug)
and/or SpO2 <90%
NO
Not needing respiratory support
Discuss with Paediatrician, consider non urgent transfer: Private car or Ambulance
YES
Needs pressure ± O2
Discuss with Paediatric consultant
Gestation less than 36/40
Gestation more than 36/40
Start Bubble CPAP in ED
Discuss with RPH Paediatric Consultant
Needs Waikato retrieval
Start Bubble CPAP in ED
Discuss with RPH Paediatric Consultant
IV access/Bloods/ Antibiotics if needed
Review work of breathing after 60 minutes on Bubble CPAP
If baby settled on CPAP with FiO2 between 21% and 30 % start baby on AIRVO
If baby not settled or FiO2>30% on CPAP
Needs Waikato retrieval
Settled and SpO2 >92% after 30 min on AIRVO with FiO2 max 30%:
2 person ambulance transfer to RPH with AIRVO in incubator
Not settled or SpO2 <92 % on AIRVO at FiO2 30%:
Needs Waikato retrieval

# F+P BUBBLE CPAP

# PREHOSPITAL SOLUTIONS

- COVID and mitre 10

# HOW

- Cut 1 arm of nasal cannula, tie knot
- Fill bottle of water, cut hole
- Cm marks from water level
- Insert free end to 5cm depth
- Trim nasal prongs
- Oxygen flow until bubbles (0.5-1L/min) throughout cycle
- Reassess work of breathing, vital signs