Report on Bubble CPAP use in Enga Province

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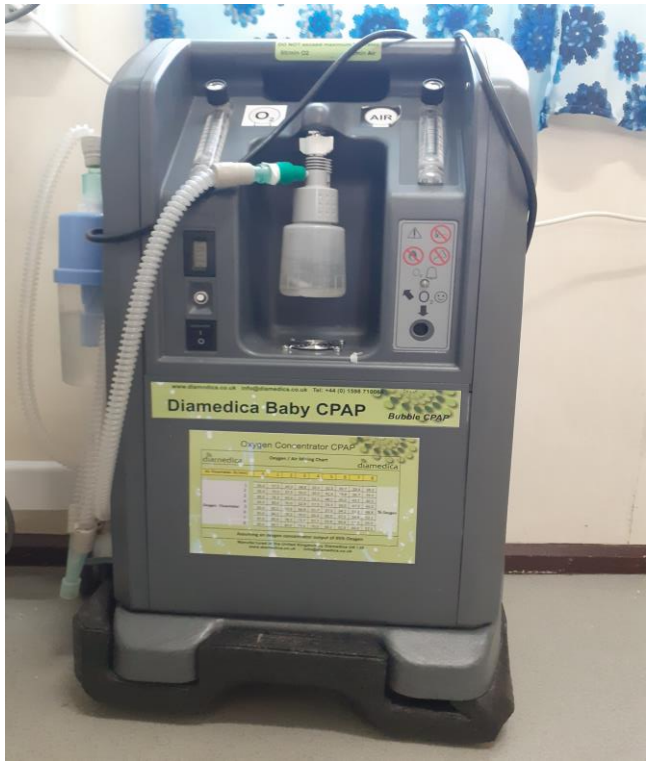
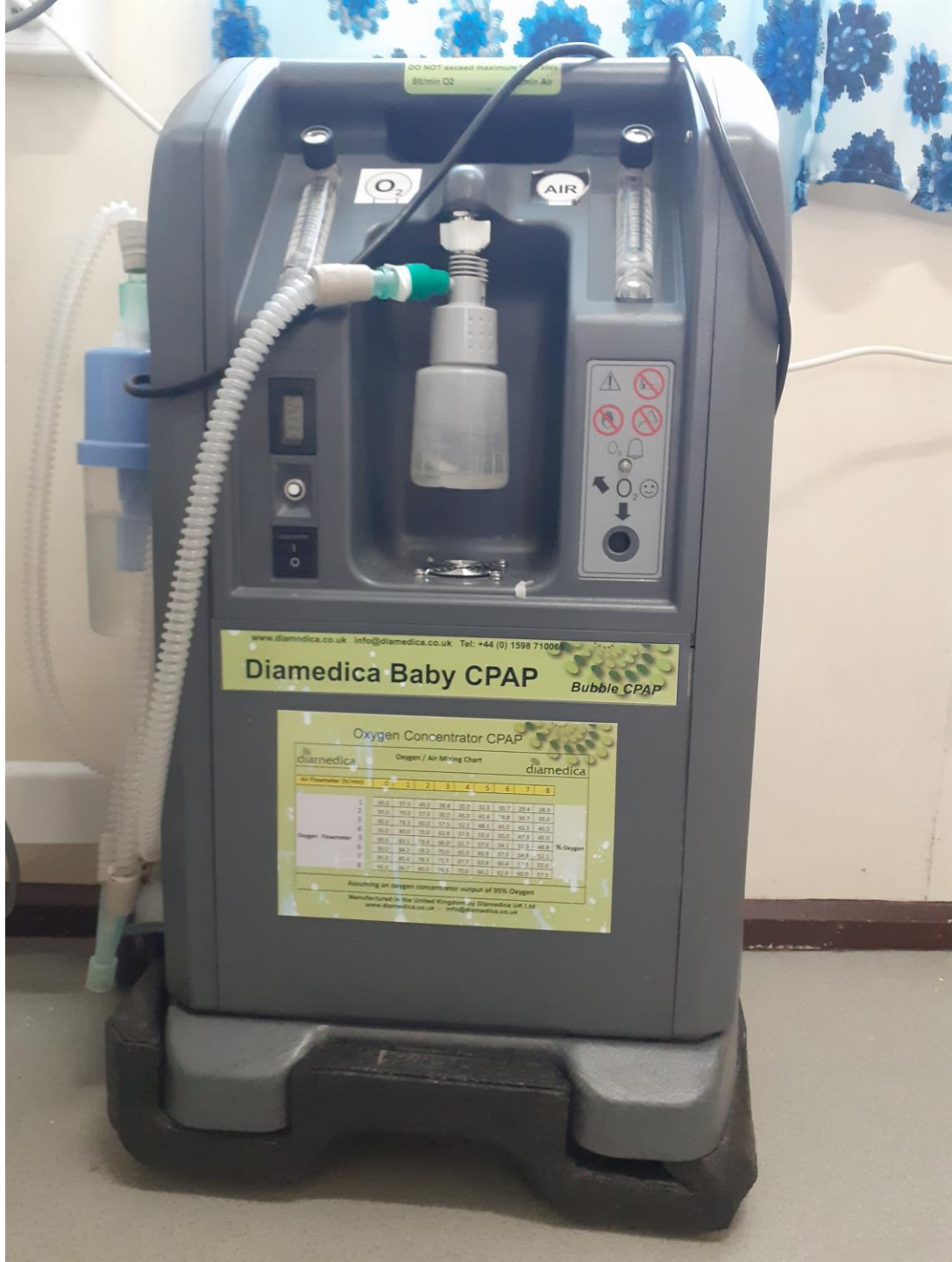


Continuous Positive Airway Pressure / CPAP

Is used to maintain continuous positive pressure during <u>both inspiratory and expiratory phases when the infant is breathing spontaneously</u>



Effects of CPAP

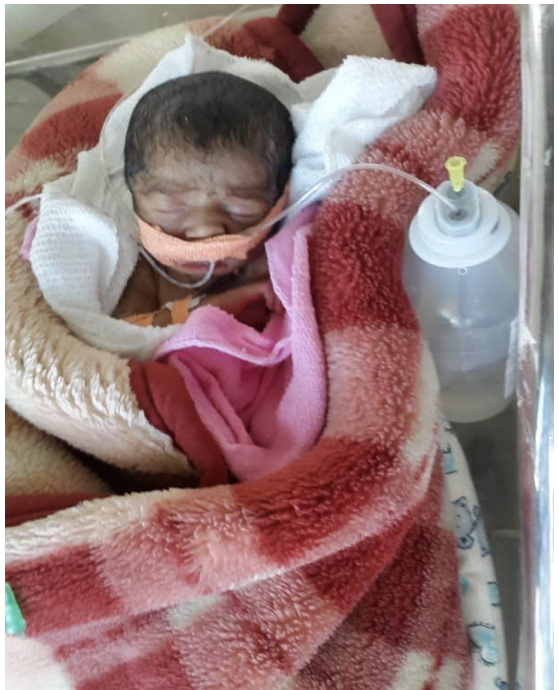
- Increase in Functional Residual Capacity leading to an increase in PaO2
- Increase pulmonary compliance
- Increases spontaneous TV and reduces respiratory effort
- Decrease in alveolar-arterial oxygen pressure gradient
- Prevents alveolar collapse & Increases airway diameter
- Conserves surfactant & Splints the airway / diaphragm
- Reduces mechanical obstruction eg, meconium

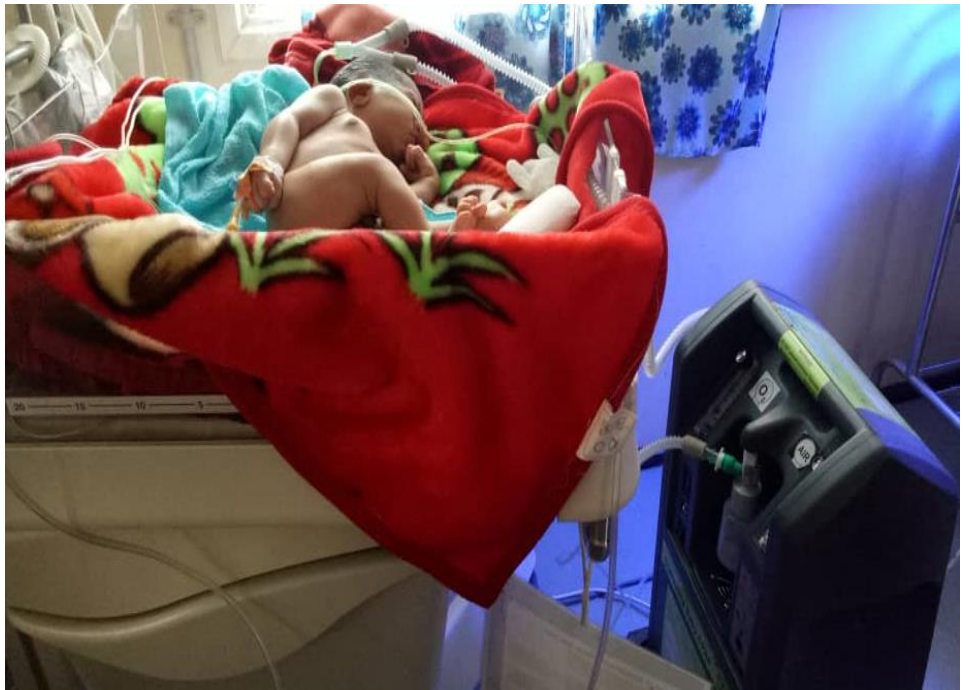
Indications for CPAP

- **Any signs of significant respiratory distress such as;**
  - Tachypnoea, nasal flaring, grunting, retractions, cyanosis, oxygen requirement
- **Diseases with low functional residual capacity;**
  - RDS, TTN, Pulmonary edema
- **Meconium aspiration syndrome**
- **Airway closure disease;**
  - Bronchiolitis, PNA
- Weaning from mechanical ventilation
- Tracheomalacia
- Diaphragmatic paralysis

Why using CPAP in Enga province?

- To prospectively evaluate the use of Bubble CPAP in children with Severe PNA and other ALRTIs, who do not improve with standard oxygen therapy

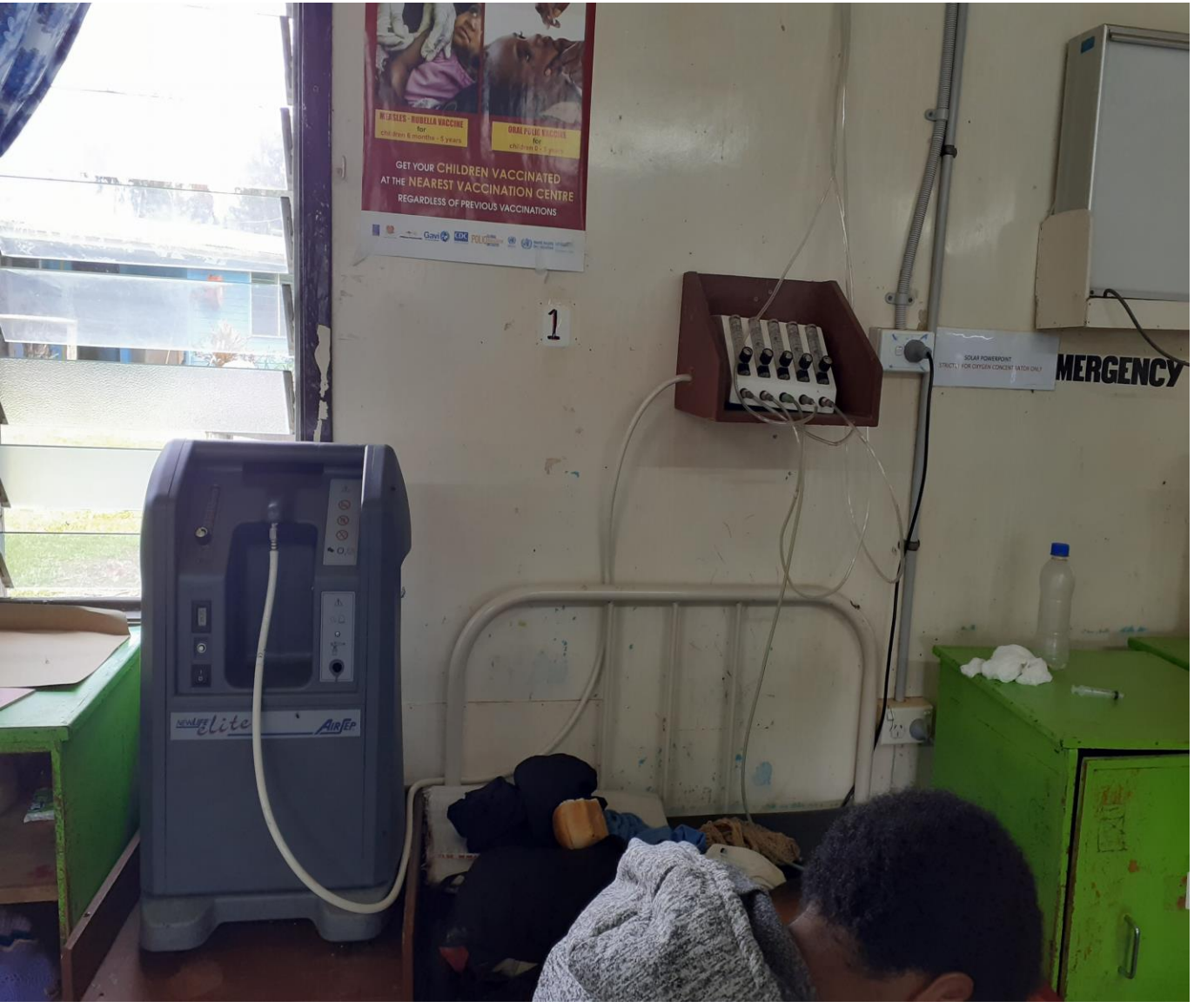


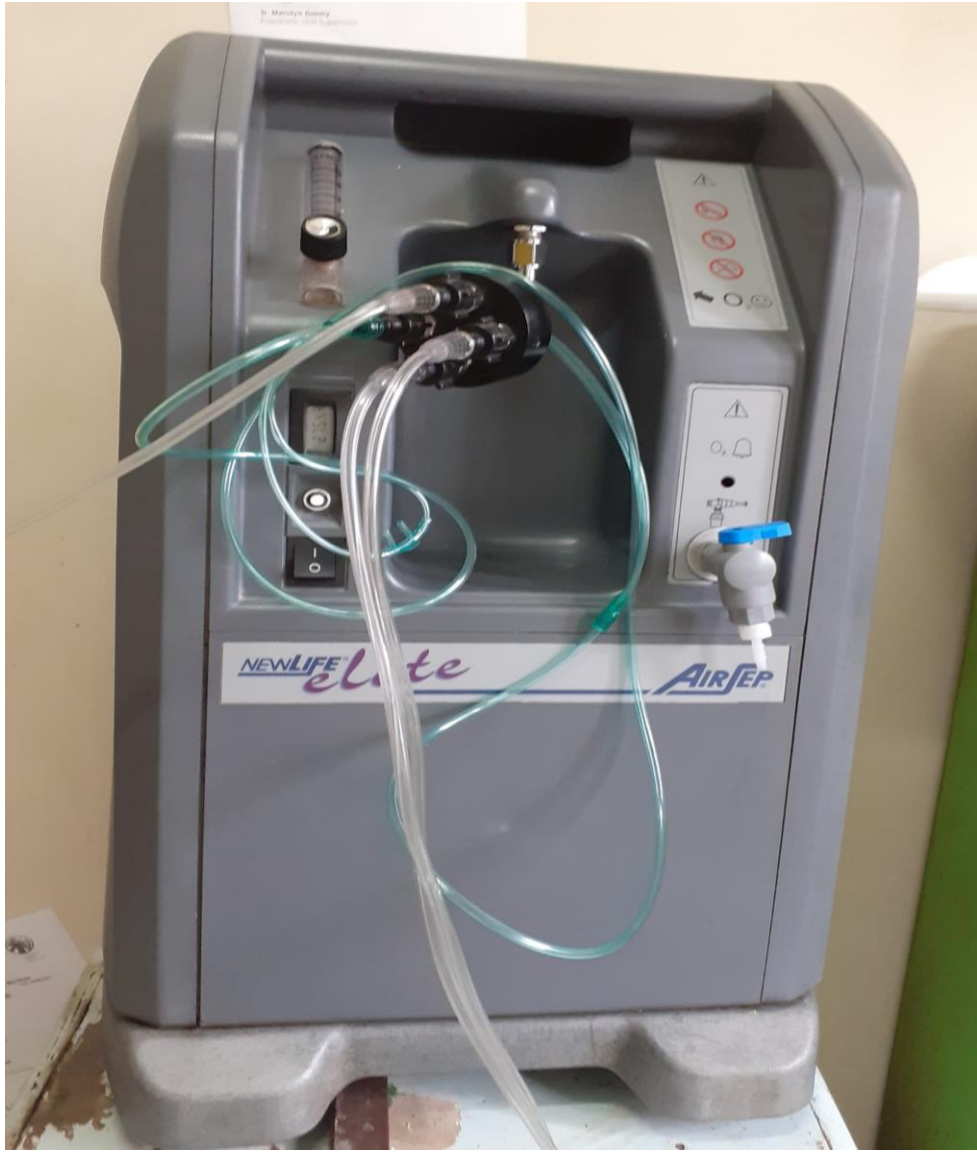


Method

- The Bubble CPAP machines were introduced into the province in November 2018
- CPAP set up and ready to use in December 2018
- Children who did not improve on standard oxygen therapy where included for CPAP

Improvised standard oxygen therapy





SUMMARY OF PATIENTS WHO REQUIRED CPAP - EPHA (Dec 2018-Jun 2019)

Patients ID	Diagnosis / conditions	Cor-morbidities	Indication of CPAP	Complications of CPAP	Outcome
b/o JRY, F/0/7, Enga, LOHS: 3/7, wt: 2.4kg	MAS/SBA/HIE Very sick on admission	sepsis on D2 in ward cephalohematoma	SpO_2 60-68% despite O_2 at 2L/min	Nil	Died most likely due to Sepsis
EJ, M 10/12, Enga LOHS: 5/7	ABM ?TBM Sev PNA not in HF	AGE PTB (CXR)	SpO_2 65-84% despite O_2 at 2L/min	NIL	Died most likely due to Meningitis
b/o LP, F/0/7, Enga LOHS: 2/7, wt: 2.9kg	SBA/MAS/NNS Toxic on admission	RVI exposed/hypothermia /maternal sepsis 4/7 before delivery	SpO_2 46% despite O_2 at 2L/min	NIL	Died mostly due to sepsis
b/o MP, M/0/7, Enga LOHS: 11/7 wt3.88kg	SBA/MAS with HIE	NIL	SpO2 33% despite O2 at 1L/min	NIL	Cerebral palsy
B/O GH, Enga, M1/7 LOHS: 3/7 wt 3kg	SBA	NIL	SpO_2 69% despite o_2 at 2L/min	NIL	Growing healthy
b/o NJ, Enga, f/0/7 LOHS: 18/52 now *Still in the ward*	PT/ELBW (800g)	CHD-PDA/PHTN Anaemia of prematurity/resolved sepsis	SpO_2 30-56% despite O_2 at 2L/min	Nasal prongs too big Bloated abdo, air drained by NGT	Surviving with CHD / oxygen dependent/ PHTN

RESULTS

- 6 patients required CPAP
  - 3 (50%) survived
  - 3 (50%) died of comorbidities/illness
- CFR : 50%

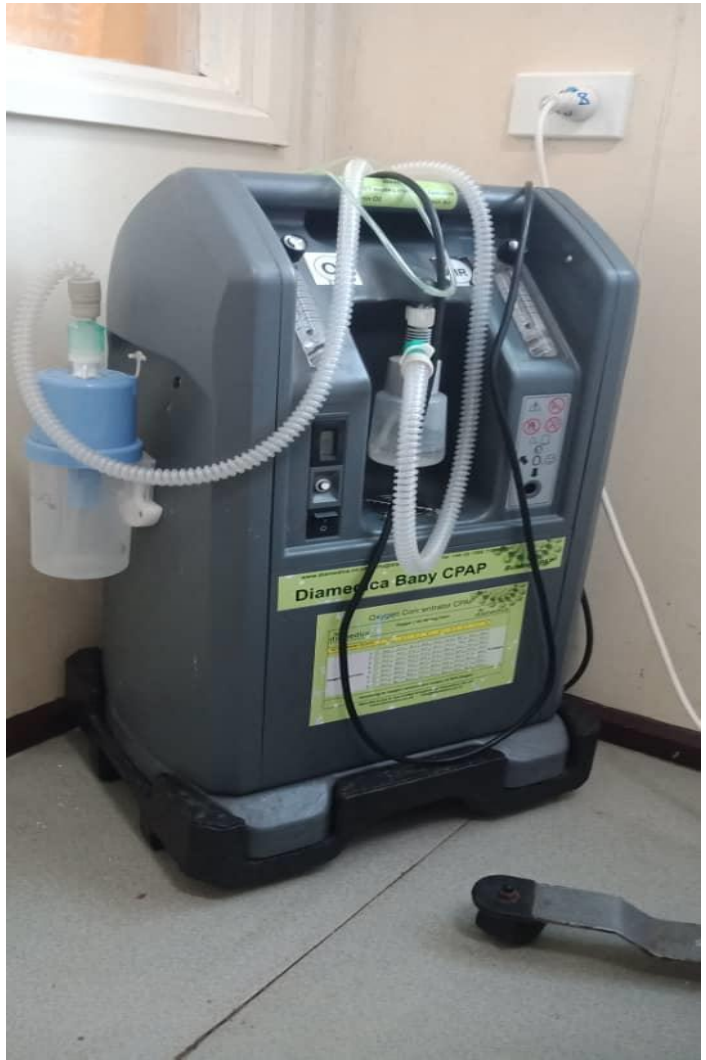
EPHA SCN WARD CFR SUMMARY FROM 1/1/19-30/6/2019

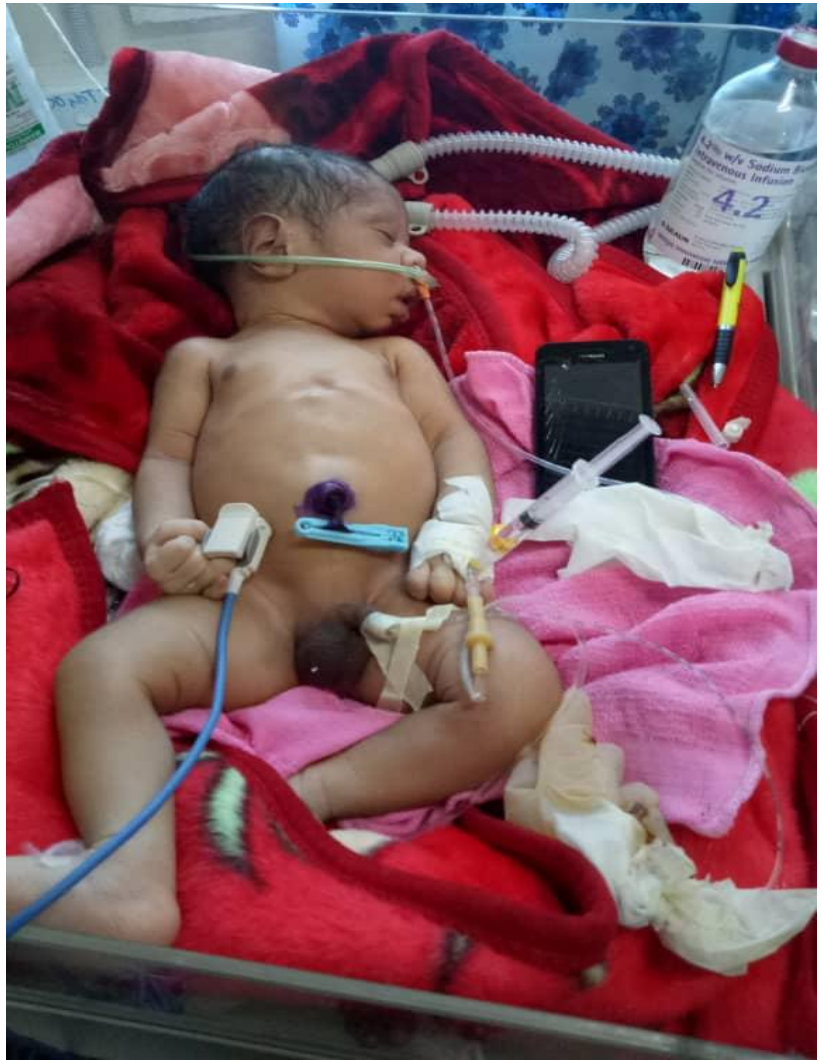
CONDITIONS	TOTAL ADMISSIONS	TOTAL DEATHS	CASE FATALITY RATE (%)
PREMATURITY	15	9	60
NNS	53	6	11.3
BIRTH ASPHYXIA	16	2	12.5
RDS	0	0	0
LBW/VLBW/ExLBW	81	16	19.8
CONGENITAL MALFORMATIONS • CHD • GI ANOMALIES • LIMB ANOMALIES	4	2	50

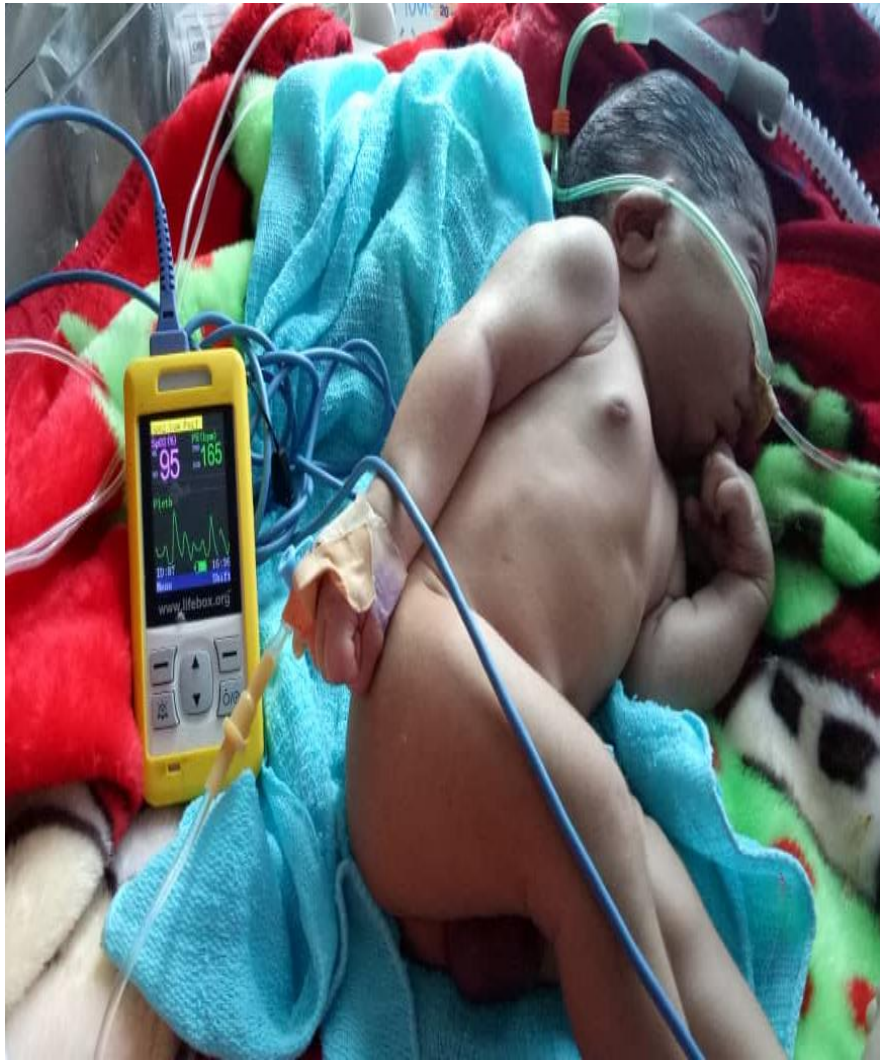
EPHA GENERAL WARD CFR SUMMARY FROM 1/1/19-30/6/2019

CONDITIONS	TOTAL ADMISSIONS	TOTAL DEATHS	CASE FATALITY RATE (%)
SEVERE SEPSIS/SEPTIC SHOCK	1	1	100
CEREBRAL PALSY	4	3	75
SAM/MAM	185	32	36.5
CANCER	3	1	33.3
MENINGITIS	19	4	21.1
HIV	15	3	20
DIARRHEA/DESENTRY/TYPHOID	67	9	13.4
TUBERCULOSIS	44	4	9.1
PNA/BRONCHIOLITIS/ASTHMA	194	2	1
AFP	4	0	0

Problems encountered during use of bubble CPAP







DISCUSION

- 1ST Province outside of Port Moresby to use bubble CPAP
- EPHA don't not have enough oxygen cylinder, x1 in general pediatric ward, x1 in COPD
- We use oxygen concentrator to convert oxygen from the air to standard oxygen therapy
- No more power problems, standby solar to generate power for both CPAP and oxygen concentrator
- SCN do not have oxygen headbox, if standard oxygen therapy does not help, next option is CPAP

CONCLUSION

- The outcome of patients depends on comorbidities/severity of illnesses
- The 3 patients (50%) who died, died of comorbidities/illnesses and **not** because of the use of bubble CPAP
- Some technical problems were encountered during administration of CPAP and needs readjustments
- Very good nursing / skilled care givers with the use of CPAP in EPHA

RECOMMENDATIONS

- Need of smaller nasal prongs / Hudson prongs size 0-5

Acknowledgement

On be half of the people of Enga Province, we would like to say thank you to;

- Prof Trevor Duke for assisting bring bubble CPAP to Enga with the aid of BMGF
- Dr Francis Pulsan for his supervisory visits and advise on setting up CPAP
- EPHA for freight costing
- Dr D Panauwe for improvising, recommendations and all that helped EPHA pediatric to where it is right now

References

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THANK YOU