



# Safety, feasibility and efficacy of outpatient management of moderate pneumonia at Port Moresby General Hospital: a prospective study

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# Aim

- To trial a model for outpatient management of moderate pneumonia in COPD Port Moresby General Hospital so that such children are not admitted but treated as outpatient in a way that is safe, effective and feasible

# Objectives:

1. Safety
  - admission rate in 3 and 5 days
  - mortality to zero
2. Efficacy
  - cure i.e. resolution of signs of pneumonia at 6 days
3. Feasibility
  - number of children with moderate pneumonia in to this model can be applied to
  - recognising danger signs on D 1 & 2
  - % oximeter reliable in outpatient.

# Introduction

- Pneumonia is the leading global cause of morbidity and mortality in children under 5 years old world wide.
- 2015- 5.6 million children died worldwide (18% PNA)
- Developing countries – in PNG pneumonia its top 5 causes of death
- In PNG 2015;
  - 21% Pneumonia admissions
  - case fatality rate (CFR) of 4.9%,
  - severe pneumonia had CFR of 11.9%.
- To reduce admissions a model of outpatient pneumonia management is needed.

# Standard Treatment for Common Illnesses of Children in Papua New Guinea:

<b>Classification of severity of pneumonia</b>		
<b>Cough and difficult breathing with...</b>		
<b>Severe pneumonia</b>	Too sick signs, cyanosed	Admit. Give oxygen & chloramphenicol, if cough persist more than 14 days then do TB score
<b>Moderate pneumonia</b>	Chest indrawing	Admit, benzylpenicillin IV for 24 hrs, if improve then change to amoxicillin for 1 week Do TB score if cough > 14 days
<b>Mild pneumonia</b>	Fast breathing	Home on oral amoxycillin
<b>Simple cough</b>	No signs	Home on cough relieve remedy

Previously what WHO called “severe pneumonia”, PNG called moderate pneumonia

# Literature Review

- In 2008, an observational study in Bangladesh and a randomised controlled trial in Pakistan showed that children aged 2-59 months who have severe pneumonia but no signs of very severe pneumonia can be safely and effectively treated at home with oral amoxicillin after diagnosis in health facilities.

Lancet 2012: 379, February 25<sup>th</sup>

- “ Severe Pneumonia (Mod PNA) can be effectively treated in the community” (WHO)

# Methodology

All patients screened at COPD and identified only moderate pneumonia cases from July 2015-July 2016.

## Inclusion criteria:

- I. Moderate pneumonia,
- II. Aged 1 month to 12 years old
- III. Informed consent from legal guardian

## Exclusion criteria:

- I. Chronic illnesses- malnutrition, TB, HIV, known asthma
- II. Congenital abnormalities e.g. Down syndrome, CHD
- III. Persistent vomiting
- IV. Caregiver refused to participate

# Day 1

Patients were recruited and recorded the information as below:

## 1. Socio-demographical information:

- Time and date, residence
- Patients name, Mothers name,
- Mothers education level and contact details

## 2. Clinical information:

- Weight, Age , Sex
- duration of cough, feeding, convulsion,
- Examination: vital signs - HR, RR, axillary Temp, SpO<sub>2</sub>, chest indrawing, wheeze
- Stat benzylpenicillin 50,000 units/kg IM & observe for 2-3 hrs
- Short video shown to identify signs of severe pneumonia
- At pm on day 1, if no signs of severe pneumonia than child sent home on oral amoxyl 25mg/kg TDS and reviewed on day 2



## Day 2

- Admitted if severe PNA or danger signs
- Examined vital, clinical signs
- If well home on oral amoxyl
- Phone contact if absent & reason noted
- No phone= lost to follow up (LTFU)
- Admitted patients were followed up until discharged
  
- All data collected were analysed using SPSS version 20.

## Definition of treatment failure

1. Developing signs of severe pneumonia and admitted
2. Symptoms persist after 5 days completion of oral amoxicillin
3. Death

## Danger signs

- Cyanosed or SpO<sub>2</sub> 90% or less
- Not breast feeding well or vomiting
- Has signs of heart failure i.e. hepatomegaly, pulse rate is 160 bpm or more
- Convulsion+

## Definition of partially improved

Signs of moderate pneumonia resolved but subject has other symptoms from another illness

Correct dose, frequency and duration of oral amoxicillin:

25mg/kg TDS for 5 days

# Picture of equipment used in this study



# Results – demographic characteristics (n=120)

- 120 patients recruited
- Gender – male 71 (60%) , female 49 (40%)
- Median age 12 (IQR 6-24) months
- Median weight 8.95 (IQR 7.4-12) kg
- Mothers education: 33% no education, 27% primary, 25% secondary, 15% Tertiary (67% some form of education)
- In possession of phone 75 (63%)

Summary of study

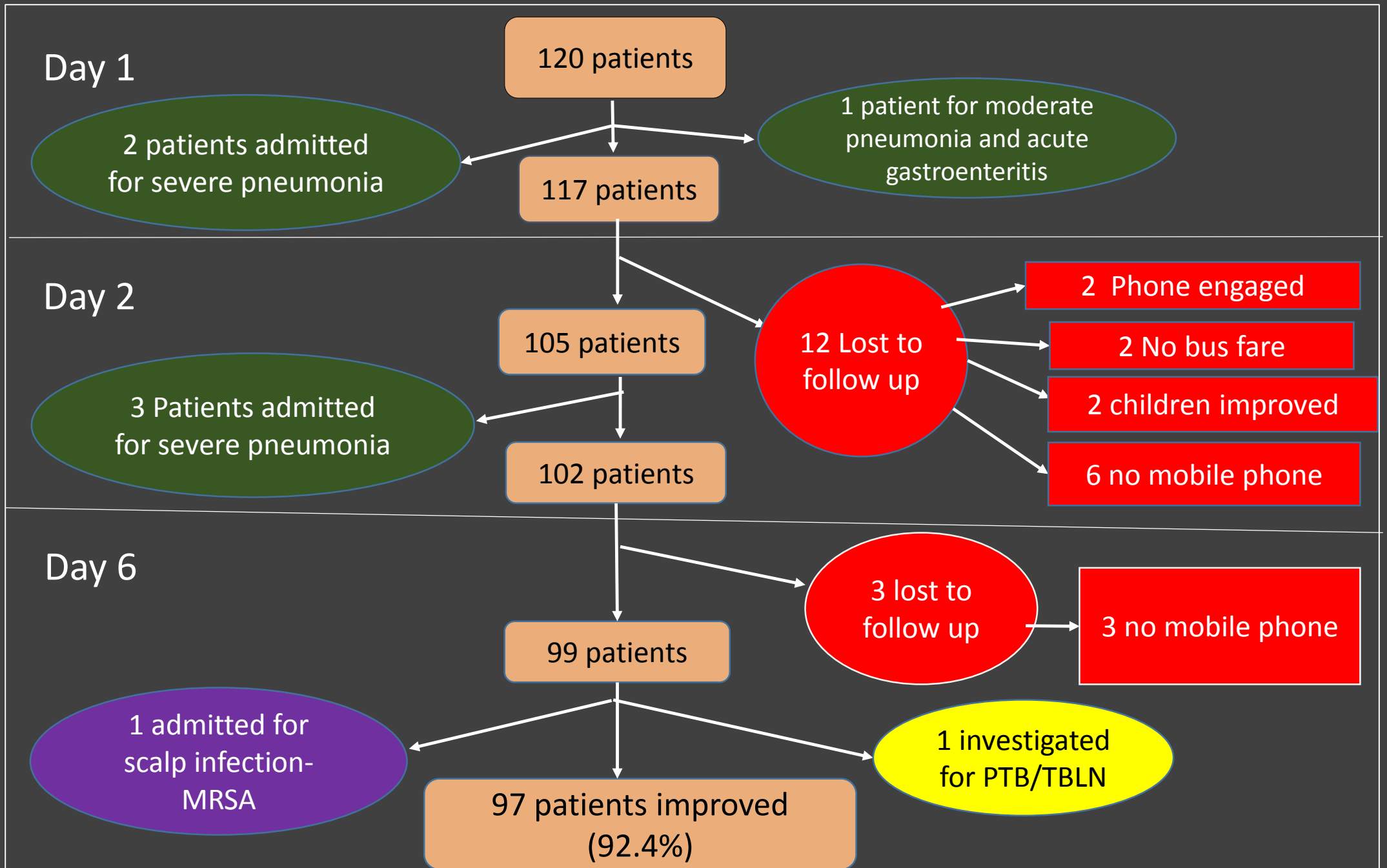


Table 1

<b>Clinical characteristics</b>	<b>Day 1 n=120</b>	<b>Day 2 n=105</b>
<b>RR (breaths per min, median, IQR)</b>	50 (48-58)	38 (36-42)
<b>HR (beats per minute, median, IQR)</b>	150 (130-166)	129 (108-140)
<b>Temp (C), median, IQR</b>	37.5 (36.7-38.6)	36.7 (36.5-38.6)
<b>SpO<sub>2</sub> (%) median, IQR</b>	97 (95-99)	98 (96-99)
<b>Cyanosis n (%)</b>	none	1 (0.95)
<b>Chest indrawing n (%)</b>	120 (100)	54 (51)
<b>Wheeze n (%)</b>	79 (65.8)	28 (26.7)
<b>Not Feeding well n (%)</b>	4 (3.3)	4 (3.8)
<b>Duration of cough (median, IQR)</b>	3 (1-5)	
<b>Was the medicine given correctly?</b>	<b>Day 2 n=105</b>	<b>Day 6 n= 99</b>
<b>Correctly</b>	98 (93.3)	97 (98)
<b>Not given correctly</b>	5 (4.8)	2 (2)
<b>Not given</b>	2 (1.9)	0 (0)

- Of 120:
- 105 came for review on Day 2
- 15 (12.5%) failed to come for review
  
- Fever
  - 60 patients on D1 (3 admitted)
  - 7 patients on D2 (5 had fever in D1& D2 ,none admitted while 2 had fever on D2 and 1 of them got admitted)
  
- Hypoxaemia
  - 2 (0.8%) had SpO<sub>2</sub> <92%. Both admitted on D2 for severe PNA
  
- Chest indrawing
  - 120 had chest indrawing on D1 (criteria for selection)
  - 54 (51%)Chest indrawing on D2.
  
- Wheeze
  - 79 (65.8%) had wheeze on D1
  - 28 (26.7%) had wheeze on D2 (51 improved of the 79)

- Children requiring admission

- Day 1: 3 admitted on D1 (2.5%) . 2 were not feeding well and vomiting out feeds and 1 had diarrhoea while at COPD under observation.
- Day 2: 3 patients admitted on day 2. That is out of 105 who turned up hence 2.8% admission rate. Of the 3, one was cyanosed (SpO<sub>2</sub> 87%) and 2 were not feeding at all and had head nodding.
- Total admission =6, severe pneumonia 5 & 1 for moderate pneumonia with AGE; all survived and were discharged from the ward

- Final outcome

- 99 improved (92.4%), 6 admitted (5%), 15 lost to follow up (12.5%)
- All survived



## 1. IS IT SAFE?

Yes, only 6 admitted (5%) out of 120 patients and zero mortality

## 2. IS IT EFFECTIVE?

Yes, 97 out of 120 patients improved (92.4%) on D6 after completion of amoxicillin

## 3. IS IT FEASIBLE?

Yes, parents recognised danger signs on D1 and D2 and pulse oximeter was useful

- 2 not feeding and vomiting feeds on D1

- 2 not feeding and head nodding and 1 cyanosed on SD2

# Discussion and conclusion

- It is feasible, safe and effective to manage children with moderate pneumonia as outpatient
- Low rates of admission (6 of 120 = 5%), and LTFU (15 of 120 = 12.5%)
- Numbers small-unable to identify any indicators
- LTFU- not sure what happen to them but no deaths from PMGH record
- **As long as safeguards are in place**
  - Excluding high risk patients (HIV, neonates)
  - Checking for danger signs and hypoxaemia
  - A protocol for education of mothers, including teaching about danger signs and when to return (use structured teaching materials and video)
  - Follow-up
  - Reassessment if a child is not improving to detect undiagnosed conditions which may look like moderate pneumonia (TB, congenital heart disease, HIV)

# Discussion and conclusion

- Benefits of outpatient management:
  - Avoid hospital overcrowding
  - Avoid iatrogenic consequences of being in hospital (secondary infection)
  - Empower parents to care for their children when moderately unwell
  - Lower cost to health service and to families

# Limitations / Recommendation

- Larger sample size would have been useful
- Multi-site study
- Maybe stat dose of benzyl penicillin is not necessary

# References

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