CPAP KENYA TRAINING MODEL

DR ODERO N A
Outline

• Introduction and background.
• Training objectives
• Course content
• Training materials and methods.
• Progress made
• Success and challenges
• Questions
• Summary
INTRODUCTION

• The CPAP Kenya training program was developed to introduce and proliferate CPAP in Kenyan Hospitals.

• It is an innovative didactic simulation training that focuses on training of trainers using core aspects of adult education.

• Designed to be sustainable and practical with the ultimate goal of improving child survival in a resource-limited setting.
Introduction

• In a randomized-controlled trial done in Ghana to evaluate n-CPAP in children, nurses were successfully trained using this model and safely applied CPAP to patients. No complications were reported.

Justification

• At the time of program inception, there was no on-going CPAP training program.
• No active CPAP provision at district and provincial hospitals.
• No pre-service training.
CPAP training objectives

• Describe at least three indications for CPAP
• Describe four ways CPAP aides in respiratory distress;
• List the five key components of the CPAP mechanics;
• Identify at least three features of respiratory distress;
• Identify at least five causes of respiratory distress;
• Identify at least five potential complications of CPAP and strategies to prevent them;
• Demonstrate correct placement of CPAP on a training mannequin.
Course content

• Introduction
• Respiratory distress
• CPAP set-up and application
• Complications
• Monitoring and discontinuation of CPAP
• Training and educating others
Training package

• A comprehensive package was developed through a multinational implementation program to identify and address barriers and develop a training curriculum to train clinicians on CPAP.

• The package addresses adult learning principles to ensure frontline clinicians are prepared to integrate CPAP into daily practice.
Comprehensive training package

Consists of:

- PowerPoint presentations (90mins)
- Training manual
- Bedside CPAP guide
- CPAP set-up and application video (15 minutes)
- Simulation training kit
Training manual

• Developed in collaboration with KPA, RPA, sidHARTe, CPHD and Health Builders with funding from GE Foundation.
• Contains 10 chapters.
• Continuously improved and updated
CPAP MANUAL
CPAP guide

- Provides a quick reference during simulations and bedside training.
- Also used to guide clinicians in day to day practice.
# Initial quick guide

## CPAP: Quick Guide

### Setup
1. Fill bottle with 7 cm of water
2. Add 1 capfull of vinegar into the water bottle
3. Plug in CPAP Machine
4. Attach grey tubing into machine (two styles shown)
5. Attach White, Blue, Grey tubing

### Application
1. Position patient
2. Ensure clear airway
3. Apply hat or elastic headband
4. Insert safety pins
5. Apply PRN adapter

6. Insert nasal prongs
7. Attach tubes to nose piece
8. Secure tubes with rubber bands
9. Turn on machine
10. Check for bubbles

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**Illustration by:** [bee redesigns](#) 5.22.14

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**Center for Public Health & Development**
Quick Guide

CPAP: Quick Guide

Vital signs: (Adjust oxygen 1 and when needed)
Suctioning: (recommend every two hours)
Nasal/Septal evaluation for skin breakdown: (remove prong to check)
Reposition patient: (recommend every four hours)

Gastric aspiration: (as needed)
Check position of expiratory tube in bubble bottle
Nasal saline drops if humidification is needed/not provided

1: Water not bubbling?
2: Prong won't stay in place
3: Patient is not calm
4: Iris skin breakdown
5: Why is patient having so many secretions?
6: Forgets to add vinegar, I don't have vinegar.

Troubleshooting
- Check all circuits and PRN adapter & tubing connections
- Adjust the blue tubing slowly between 4-6cm
- Look at the nasal prongs: Are they the correct size for patient?

- Is the prong the right size?
- Does the fit fit well?
- Is blue and white tubing at correct place on head?

- Does the baby need suctioning?
- Is there gastric distention?
- Pat the patient's chest lightly/hold/swaddle patient/rock patient or provide pacifier or breast

- Check prong size
- Monitor every six hours
- Notify doctor/MA/CD

- This is normal while patient is on CPAP
- Monitor patient and suction as needed
- This is ok.
- Label Water bottle:
- With Vinegar: Change water every 3 days.
- Without vinegar: Change water everyday.

Set-up supplies
- Blue oxygen adapter
- Tubing set
- CPAP machine (with cord)
- Oxygen tubing
- Water bottle
- Vinegar
- Gray tubing
- Humidifier
- Oxygen source

Application supplies
- Knit cap
- Head band
- Towel (positioning)
- Rubber bands
- Bulb suction
- No tube

Updated edition
CPAP Diagram (and Supplies)

1. Tape measure
2. 7 cm water and 1 cm of vinegar
3. Luer lock cap
4. Towel
5. Safety pins and rubber bands
6. 1 lat
7. White adapter
8. Oxygen adapter (1)
9. Air supply tube
10. Power source
11. Power cord
12. Oxygen
13. Suction Supplies

* Not always needed

Water bottle

Expiratory tube

Inspiratory tube

Nasal Prong (Delivery Method)

CPAP machine
CPAP video session
Skills teaching by simulation

• Enables the participants to observe the CPAP set-up and application performed by an expert before practice in groups.
Simulation sessions
Skills practice
Evaluation

- Knowledge evaluation using MCQs
- Skills assessment using a structured tool
- Course evaluation by participants
10.2 CPAP Skills Evaluation

<table>
<thead>
<tr>
<th>CPAP Set Up</th>
<th>Yes □</th>
<th>No □</th>
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<tbody>
<tr>
<td>1. 7 cm of clean water is in bottle (bottle labeled with tape measure)</td>
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<tr>
<td>2. One cap full of vinegar added to water (0.25% acetic acid solution)</td>
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<tr>
<td>3. Expiratory tube is placed 5cm in the water and secured to the bottle</td>
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<tr>
<td>4. Air supply tube is attached to machine and machine is plugged into a power source</td>
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<tr>
<td>5. Air supply tube, oxygen, white adapter and inspiratory tube connected</td>
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<tr>
<th>CPAP Application</th>
<th>Yes □</th>
<th>No □</th>
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<tr>
<td>6. Patient: positioned in neutral position with towel</td>
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<tr>
<td>7. Airway cleared (or checked)</td>
<td></td>
<td></td>
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<td>8. Elastic headband or hat placed on patient</td>
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<tr>
<td>9. Safety pins placed on hat between the eye and ear</td>
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Skills evaluation session
Training process

• An instructor:participants ratio of 1:5 is maintained throughout the training sessions.
• For ToT training a pediatrician and a nurse conducts the training to 10 or less participants.
• Day 1 of the training is spent learning about CPAP (provider training) followed by knowledge and skills evaluation.
Training process

• On day 2 the participants discuss and perform mock trainings to fellow participants.

• Each participant spends not more than 30mins on a mock training to the group guided by the instructor who gives feedback.

• Skills building is achieved in the process

• The instructors proceed to conduct training to providers in their facilities under observation during which they are evaluated and given feedback.
A mock training session
In-service bed-side training session
Sustainability and continuity

• The initial training was led by a pediatric intensive care physician and nurse from Columbia University.
• The five-day intensive training included two days of classroom learning and three days of bedside in-service training.
• Each instructor received a training kit and comprehensive training curriculum including: PowerPoint presentation, instructor manual, training mannequin, instructional video and bedside instructional tools.
Inaugural CPAP instructor training
Sustainability and continuity

• The instructors then cascaded the training to providers at the health facility level.

• The Center for Public Health and Development (CPHD) provided logistical, technical and monitoring and evaluation support on the ground for the duration of the program.
Sustainability and continuity

• Local instructors were then mentored and facilitated subsequent training under observation by Columbia University team.

• Training eventually handed over to KPA, facilitated by a panel of local instructors.
Lectures session by a local instructor
Debriefing session
Successes

• 77 instructors trained, 40 of these by KPA
• 13 sites actively using CPAP
• Three quarterly meetings held for experience sharing and feedback.
• More than 1000 patients on CPAP.
• Local instructors independently conducting trainings
Challenges

• Staff turn-over
• Limited number of CPAP machines for in-service training.
Next steps

• Incorporation of CPAP curriculum to pre-service training.
Questions?
Summary

• The Kenyan CPAP training is an innovative didactic simulation training model.
• Focuses on ToTs based on adult learning model.
• A panel of local instructors successfully trained.
• Has succeeded in proliferating CPAP to Kenyan hospitals
Acknowledgement

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