

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.

Wilson PT, Morris MC, Biagas KV. A randomized clinical trial evaluating nasal continuous positive airway pressure for acute respiratory distress in a developing country. *The Journal of Pediatrics*. May 2013; 162(5):988-992



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

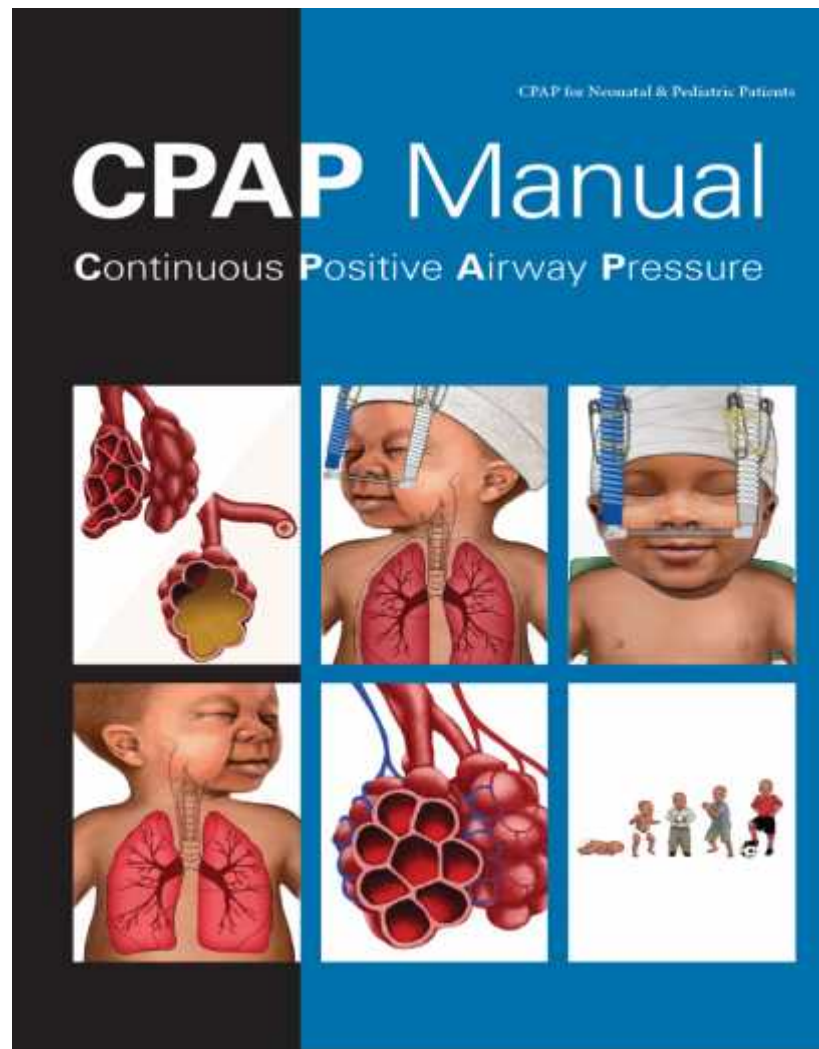
Consists of:

- 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



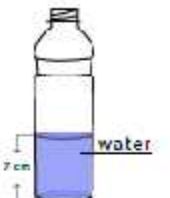

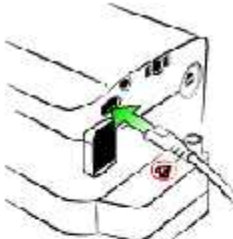




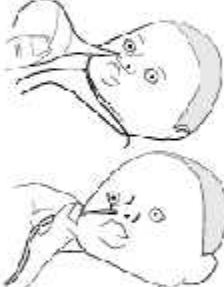



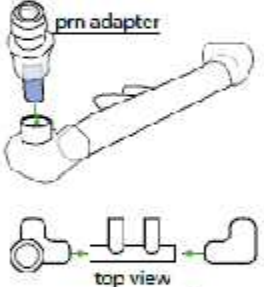
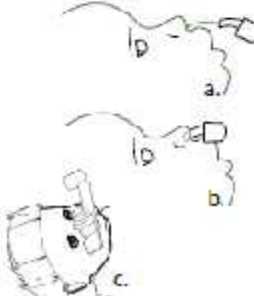
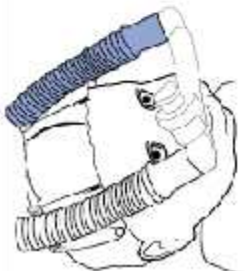
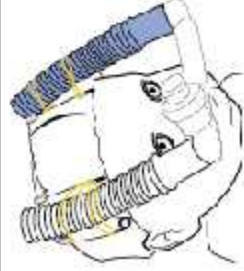

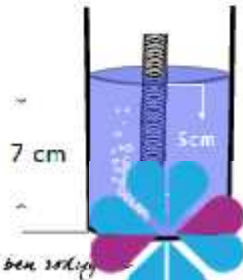
CPAP guide

- 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

Illustration by *ben rodriguez* 5.22.14

set up	<p>1: fill bottle with 7cm of water</p> 	<p>2: Add 1 cap full of vinegar into the water bottle</p> 	<p>3: Plug in CPAP Machine</p> 	<p>4: Attach grey tubing into machine (two styles show)</p> <p>CPAP no humidifier</p> 	<p>5: Attach White Blue Grey tubing</p> 		
	<p>6: Insert and secure expiratory tube</p> 	application	<p>1: Position patient</p> 	<p>2: Ensure clear airway</p> 	<p>3: Apply hat or elastic headband</p> <p>knit cap</p>  <p>elastic headband</p> 	<p>4: Insert safety Pins</p> 	<p>5: Apply PRN adapter</p>  <p>top view</p>
	<p>6: Insert nasal prongs</p> 		<p>7: Attach tubes to nose piece</p> 	<p>8: Secure tubes with rubber bands</p> 	<p>9: Turn on machine</p> 	<p>10: Check for bubbles</p> 	

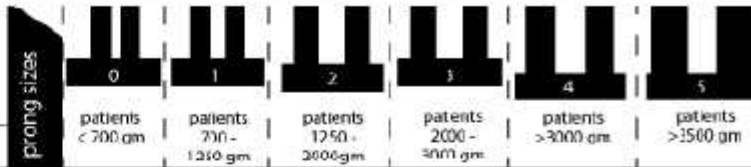
Updated edition

Quick Guide



CM ruler to measure water bottle

illustration by *ben rodrigues*



CPAP: Quick Guide 5.22.14

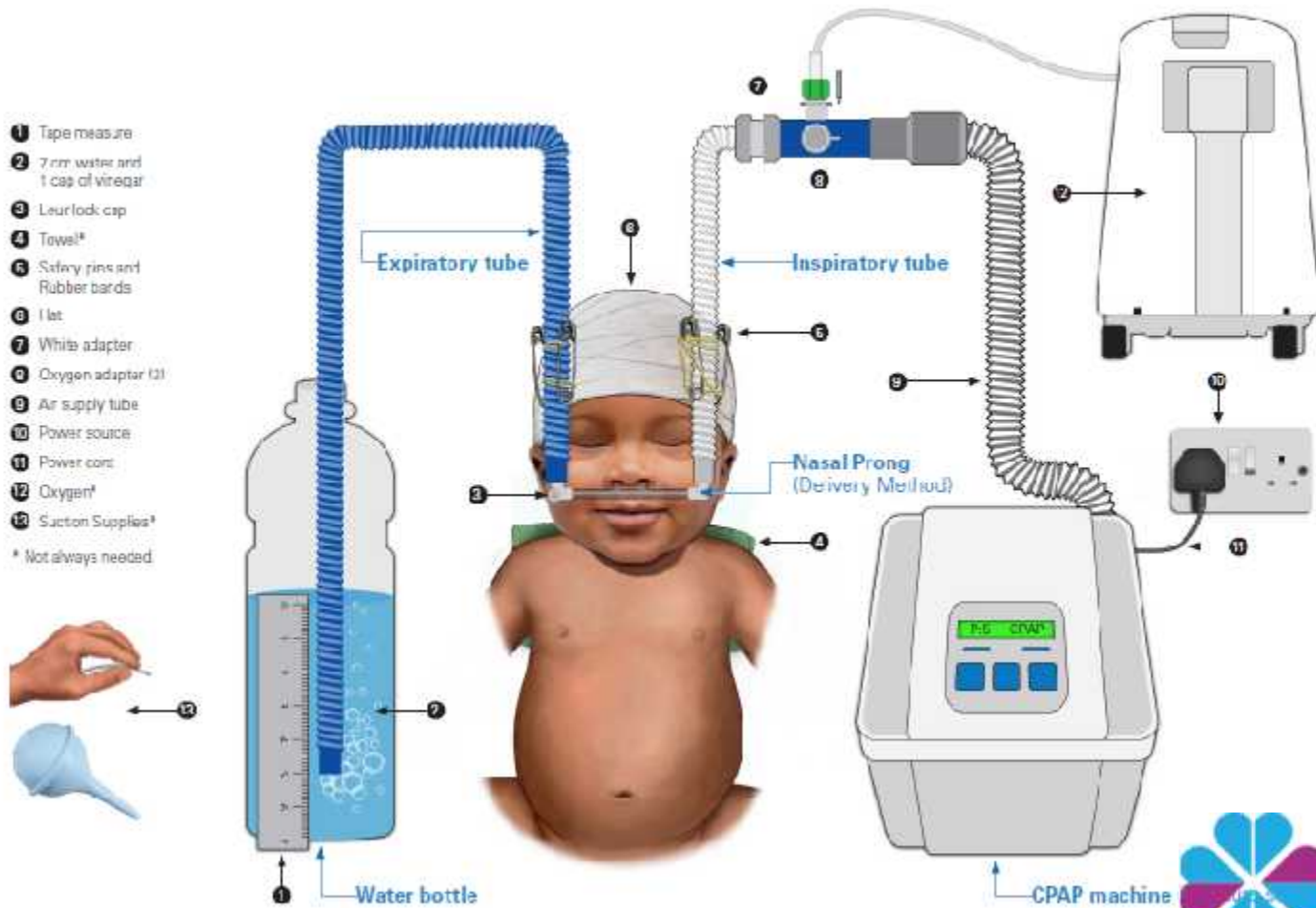
- | | | |
|----------------------------|---|--|
| <p>monitor every 6 hrs</p> | <ul style="list-style-type: none"> ● Vital signs: (Adjust oxygen f and when needed) ● Suctioning: (recommend every two hours) ● Nasal/Septal evaluation for skin breakdown: (remove prong to check) ● Reposition patient: (recommend every two hours) | <ul style="list-style-type: none"> ● Gastric aspiration: (as needed) ● Check position of expiratory tube in bubble bottle ● Nasal saline drops if humidification is needed/not provided * <p style="text-align: right;">* = May not always apply</p> |
|----------------------------|---|--|

troubleshooting	1: Water not bubbling?	2: Prong wont stay in place	2: Patient is not calm	4: I see skin breakdown now what?	5: Why is patient having so many secretions?	6: Forget to add vinegar I dont have vinegar.
	<ul style="list-style-type: none"> ● Check all circuits are closed PRN adapter & tubing connections ● Adjust the blue tubing slowly between 4-6cm ● look at the nasal prongs. Are they correct size for patient? 	<ul style="list-style-type: none"> ● Is the prong the right size? ● Does the hat fit well? ● Blue and white tubing at correct place on head? 	<ul style="list-style-type: none"> ● Does the baby need suctioning? ● Is there gastric distention? ● Pat the patients chest lightly/hold/swaddle patient/ rock patient or provide pacifier or breast 	<ul style="list-style-type: none"> ● Check prong size ● Monitor every six hours ● Notify doctor/MA/CC 	<ul style="list-style-type: none"> ● This is normal while patient is on CPAP ● Monitor patient and suction as needed 	<ul style="list-style-type: none"> ● This is ok. <p>Label Water bottle: With Vinegar: Change water every 3 days. Without vinegar charge water everyday.</p>

<p>set-up supplies</p>	<p>blue oxygen adaptet</p> <p>water bottle vinegar</p>	<p>tubing set</p> <p>grey tubing</p>	<p>CPAP machine (with cord)</p> <p>humidifier</p>	<p>oxygen tubing</p> <p>oxygen source</p>	<p>application supplies</p>	<p>knit cap</p> <p>rubber bands</p>	<p>head band</p> <p>4 safety pins</p>	<p>towel (positioning)</p> <p>PRN</p> <p>bulb suction 6 tube</p>
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CPAP Diagram (and Supplies)

- 1 Tape measure
 - 2 7 mm water and 1 cap of vinegar
 - 3 Leur lock cap
 - 4 Towel*
 - 5 Safety pins and Rubber bands
 - 6 1 lit
 - 7 White adapter
 - 8 Oxygen adapter (2)
 - 9 Air supply tube
 - 10 Power source
 - 11 Power cord
 - 12 Oxygen*
 - 13 Suction Supplies*
- * Not always needed



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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



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Skills practice



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Evaluation

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

10.2 CPAP Skills Evaluation

Name _____

Date _____

CPAP Set Up		
1. 7 cm of clean water is in bottle (bottle labeled with tape measure)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2. One cap full of vinegar added to water (0.25% acetic acid solution)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
3. Expiratory tube is placed 5cm in the water and secured to the bottle	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4. Air supply tube is attached to machine and machine is plugged into a power source	Yes <input type="checkbox"/>	No <input type="checkbox"/>
5. Air supply tube, oxygen, white adapter and inspiratory tube connected	Yes <input type="checkbox"/>	No <input type="checkbox"/>
CPAP Application		
6. Patient positioned (neutral position with towel)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
7. Airway cleared (or checked)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
8. Elastic head band or hat placed on patient	Yes <input type="checkbox"/>	No <input type="checkbox"/>
9. Safety pins placed on hat between the eye and ear	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Skills evaluation session



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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



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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



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Debriefing session



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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

- Centre for Public Health and Development (CPHD).
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- Ministry of Health, Kenya
- Kenya Paediatrics Association.
- GE Foundation

