

MODULAR CONTINOUS AIRWAY PRESSURE (MCPAP) DEVICE DEVELOPMENT SOP.

BACKGROUND

Birth Asphyxia, defined as the failure to establish breathing at birth, globally, accounts for an estimated 900,000 deaths per year with the biggest proportion in sub-Saharan Africa.

Preterm infants commonly suffer from a respiratory/breathing disorder called **neonatal respiratory distress syndrome** (RDS) as their lungs are not yet fully developed. The disease is mainly caused by a lack of a slippery substance in the lungs called surfactant that helps the lungs fill with air and keeps the air sacs from deflating. Surfactant is present when the lungs are fully developed. Neonates suffering from RDS often need breathing support until their lungs start making enough surfactant.

Continuous positive airway pressure (CPAP) as a therapy for respiratory distress syndrome, is the application of positive pressure to the airways of spontaneously breathing neonates throughout their respiratory cycle.

Conventional CPAP is very expensive and hence not affordable in resource constrained settings. We are using locally available low cost plastic bottles and tubing together with a simple pump to develop a low cost modular CPAP device. With the modular CPAP approach, we intend to locally train more people on how to develop and trouble shoot CPAP devices.

GENERAL STEPS AND PROCEDURES FOR MCPAP DEVICE DEVELOPMENT.

STEP 1: ensure that you have all the materials in place required to make a functional device as listed in the supplies listing.



STEP 2: Drill two holes on the opposite front and back of the big external container. One hole is for the Pump power cable and the other for connection of pump output to tubing.



Step 3: Insert the pump into the container.



Step 4: Drill a hole through the container cover enough to insert the PEEP bottle as shown below:



STEP 5: Drill three holes through the PEEP bottle lead. One hole is for air escape, second is for connection from Y-junction and the other for depth control using a syringe.



STEP 6: Using a connector, connect PVC tubing through the peep to the non-corrugated tubing as shown below:



Step 7: Drill two holes through the small lock container as shown below to create a humidifier. In each of the holes connect an L connector as shown below. Ensure the connectors are to avoid pressure loss.



NOTE: If any leakage is detected, use glue or any other means to seal the leakage.



STEP 9: Using non-corrugated tubing, connect the pump to the humidifier and again humidifier to Y-junction as shown below. Do this with the humidifier at the top of the container containing the pump.



Step 9: connect one end of the Y-junction to the PEEP and the other to the testing chamber as shown below. Connect the syringe at the peep control and put water in both the PEEP (adjustable depth) and the humidifier (3/4).



Congratulations!! You have just made a functional CPAP device in just 45 minutes.

