Fisher & Paykel Healthcare is dedicated to improving patient care and outcomes. With over 20 years of worldwide use and acceptance involving millions of successful resuscitations, the F&P® Neopuff™ Infant T-Piece Resuscitator has recently been updated to further enhance functionality and usability while providing optimal resuscitation.

References
Providing controlled pressures to stabilize an infant

Infant T-Piece Resuscitation is designed to provide consistent and optimal resuscitation for infants. It delivers inflation pressures while protecting the lungs from injury. Optimal resuscitation is the application of positive pressure to inflate the lungs and achieve maximum alveolar recruitment without causing further damage (and while establishing Functional Residual Capacity (FRC)).

Use of T-piece devices guarantee individual, operator dependent PIP provision, irrespective of bags. (In settings of normal lung compliance and pressure, a self-inflating bag can result in a set of saturated alveoli in the absence of alveolus recruitment."

Normal Over-distension

Normal T-piece Resuscitation

Infant T-Piece Resuscitation

A sustained inflation can result in the assistance of ventilation, less need for surface active substances with a reduction in PEEP.

Which devices can deliver a sustained inflation?

The infant T-piece Resuscitator delivers a constant pressure during a sustained inflation. In comparison, a self-inflating bag delivers a flow-inflating bag and self-inflating bag can deliver an inadvertent recruitment during a sustained inflation and furthermore it is difficult to achieve longer inflations with a self-inflating bag."

BENEFITS OF INFANT T-PIECE RESUSCITATION

Infant T-Piece Resuscitation with Optimal Humidity

An infant’s airway is in a delicate balance of the lungs and accessory muscles of respiration. Medical gases such as oxygen, nitrous and inhaled anesthetics can be extremely cold and dry and can cause excessive heat and moisture from the airway.

There can be an additional complication. In some situations where an infant’s upper airway may need to be bypassed with an endotracheal tube. This is where the majority of heat and moisture is normally added during respiration. The delivery of heated and humidified air during resuscitation has been found to reduce postnatal decrease in temperature and the incidence of hypothermia.

The “use of heat and humidification during respiratory support in very preterm infants just after birth reduced the postnatal decrease in temperature.” (Barker et al, 2012)

What is a sustained inflation?

A sustained inflation is a large inflation pressure which is delivered over a longer period of time in comparison to a normal inflation.

Infant T-Piece Resuscitation can be carried out with an endotracheal tube or a self-inflating bag. This is where the majority of heat and moisture is normally added during respiration. The delivery of heated and humidified air during resuscitation has been found to reduce postnatal decrease in temperature and the incidence of hypothermia.

“Optimal humidity can result in the accommodation of ventilation, less need for surfactants and associated with a reduction in PEEP.”

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The hospital protocol or guidelines will indicate appropriate requirements.

In comparing, a self-inflating bag delivers a flow-inflating bag and self-inflating bag can deliver an inadvertent recruitment during a sustained inflation and furthermore it is difficult to achieve longer inflations with a self-inflating bag."

To provide consistent and optimal resuscitation the infant requires less air after which cold can be delivered by Infant T-Piece Resuscitation.

1. Controlled PIP

PIP is the maximal inspiratory pressure. The main objective is delivering PIP is to inflate and resist attempts to achieve gas exchange using the lowest possible pressure. The PIP level may vary from subject to subject depending on factors such as gestational age, body size and lung compliance.

Controlled PIP can be consistently delivered reliably. More humidification is added as shown in the graph below. This square wave is the optimal time at controlled peak pressures that may open up the lungs, allowing adequate time for the surfactant to core.

2. Consistent, precise PEEP

PEEP is the pressure in the lungs at the end of expiration. Consistent PEEP allows gas to remain inside the lungs after expiration to help establish FRC. The establishment of FRC can be an effective strategy to protect the immature infant’s lungs.

INFANT CLINICIAN

Optimal resuscitation can make use of Optimal Humidity (44°C, 100%) by conditioning the gas flow to the natural level of humidity. This restores natural balance and provides a level of humidity found normally in the airways.

OXYGEN CONCENTRATIONS FROM 21% TO 100%

Infant T-Piece Resuscitation allows the clinician to achieve proper positioning by using one hand for delivering ventilations with the other to hold the infant in place.

Surface with PEEP

Surfactant plays a major role in decreasing the surface tension in the lungs and inducing the turnover of the lungs to collapse. T-Piece Resuscitation allows the delivery of surfactant while providing PEEP.

"To evaluate the ability of our resuscitation team to deliver prolonged inflations and CPAP/PEEP, the delivery modes were studied two anesthesia bags and compared them with a purpose built T-piece style resuscitator. Our results demonstrated that for all user groups, the resuscitator was easier to use compared more consistent PEEP and peak inspiratory pressures and was the only device that effectively delivered a consistent prolonged inflation. (van der Merwe et al, 2012)

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