INFANT RESUSCITATION UNIT.

TRAINING INFORMATION.

CE0086

INDEX.

1. Introduction.

This training material is intended to be used only to train personnel in how the Tom Thumb Resuscitation Unit functions and its intended use.

Exact values for pressure / flow-rate of gas etc set on the Tom Thumb Resuscitation Unit and cycles per minute etc used during resuscitation should be laid down in a separate hospital protocol. **(See Appendix "A")**

The Viamed Resuscitation Cabinet provides essential equipment for safe and easy infant resuscitation. The cabinet is a fold away system that offers:

1. Heat
2. A clock to check APGAR times
3. Suction
4. Tom Thumb Infant resuscitation unit

CABINET

When opening the cabinet door, support the weight of the door to avoid putting pressure on the hinges. Always leave the cabinet stocked up ready for use. When the door is open, excessive weight or force should not be applied to it as it will strain the hinges, and therefore not be parallel. This could result in a baby sliding off the bed.

RADIANT WARMER

The Heater unit is wall mounted with an articulated arm which folds flat to the wall when not in use (ensure the heater has cooled down before folding flat). Once the heater has been switched on and is warmed up, only touch the front panel and the side handles, which will always be cool. The heater should always be a minimum of 80cm distance from the mattress and will only warm the bassinet, not the surrounding areas. As it only takes 20 – 30 seconds to warm up, always leave the heater switched off.

For the use of the heater: refer to the "Ceratherm 600-02" Operating Instructions (Viamed Part No. 0391000)

TIMER

The Timer Clock is situated on a bracket on the left hand side of the cabinet. It is a digital clock with Start, Stop and Reset functions.

SUCTION UNIT

The ON / OFF valve adjusts the setting – set to 5 – 10 Kpa. The tubing and catheter are for single patient use only. Within the suction jar there is a blue piece of tubing, this is a splashguard and should be connected to the patient circuit. The filter, which can b found in the underside of the unit, should be changed if it becomes discoloured or wet.

TOM THUMB UNIT

The Tom Thumb unit is an easy to use, manually operated, gas powered resuscitator providing controlled and accurate resuscitation of newborn babies. The supply of oxygen arrives from the left hand side, and is delivered to the patient from the right hand side.
For use of the Tom Thumb units, follow the guidelines laid down in sections 3 & 4 of this manual..

2. Care, Cleaning and Sterilisation.

The cabinet, and its contents, should be cleaned after each use. Before cleaning, discard all disposable products, using the hospital protocols for disposal.

Clean using a damp cloth. The Tom Thumb does not normally need to be sterilised.

The flexible tubing and facemask should be cleaned, with warm water and a mild detergent after use, and left to dry (or dried off using a clean paper towel) before reuse (always refer to hospital cleaning protocols).

Do not autoclave.

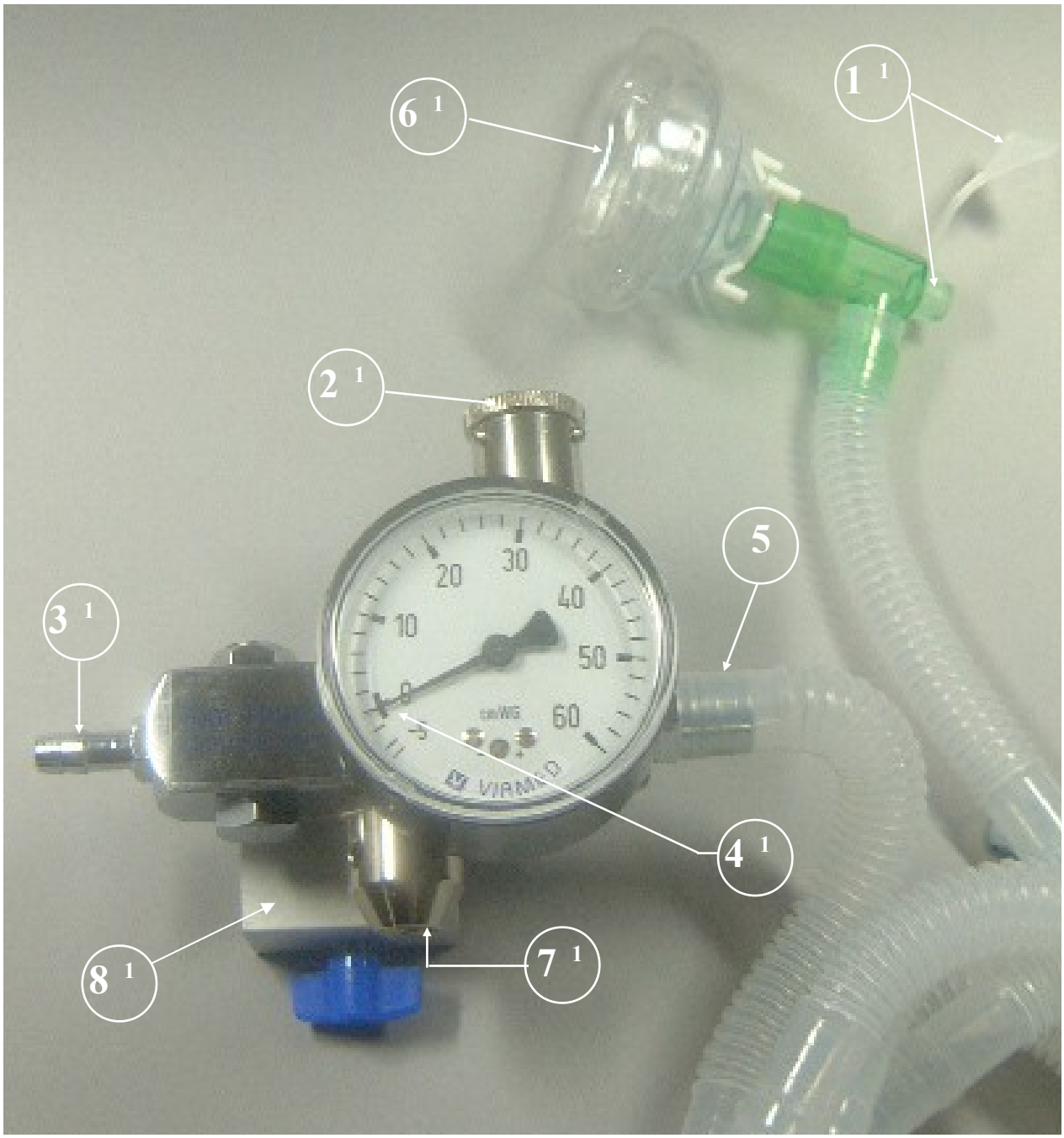
Do not allow moisture or foreign matter to enter the safety valve or adjustable valve. If either valve is suspected of containing foreign matter, then service or replace the item.

Damage may occur if the Tom Thumb is subjected to severe mechanical shock or dropped. If this happens then the unit must be given a full service and calibration, either in house (Service Manuals are available) or return the unit to Viamed.

The Tom Thumb should be serviced every 12 months, or if the pressure gauge does not read zero (outside of the black band on the gauge) with no flow, or if accuracy is doubted.

The rail bracket (⑧ (TT480) / ⑨ (tt490-15)) is designed to fit most medical equipment rails. It is advised that the Tom Thumb is not mounted close to a wall or to the side of an incubator, as there is a risk of damage while the unit is being placed on, or taken off, the rail. Spacers are available if required.

3. TT480.



Important.

For use by qualified and trained personnel only.
Do not use gas flow rates more than 15 litres / minute.
Adjust outlet pressure after altering the flow rate.
Do not attempt to adjust the safety valve ⑦.
O_2 inlet pressure from an external flowmeter.

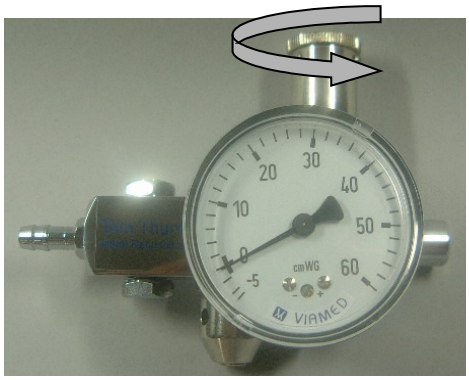
①	"T" Piece Port
②	Adjustable Valve
③	Hose Inlet
④	Pressure Gauge
⑤	Patient Tubing
⑥	Patient Facemask
⑦	Precision Valve
⑧	Rail Clamp

1.1 Pre-use Checks (TT480).

- Uncap the T piece port ①.

- Connect the inlet ③ of the Tom Thumb to a Flowmeter designed to give a regulated gas flow of between "0" and "15" litres per minute.

- Make sure the flow of gas is turned off, and turn the adjustable valve control ② to minimum (fully counter clockwise).



- Check that the pressure gauge ④ reads zero (within the black band on the gauge). If not, the Tom Thumb requires servicing.

- Connect the patient tubing ⑤ to the Tom Thumb outlet but do not apply the mask ⑥ to the patient.

- Set the external flowmeter to the required flow rate as per Hospital Protocols

- Occlude the mask and the T piece port. Gradually turn the adjustable valve control clockwise until the required outlet pressure is shown on the pressure gauge (*).

- The Tom Thumb is now ready for use.

1.2 Guideline for Use during Resuscitation (TT480).

- Follow the pre-use checks and set the required flow rate and outlet pressure.
- Apply the mask to the patient and cover the T piece port to inflate the patients' lungs at the set flow rate and pressure (*).
- Uncover the T piece port and allow the patients lungs to deflate (*).
- Repeat steps 2 & 3 as necessary during the resuscitation of the patient (follow the hospital protocols for resuscitation).

(*) Use the thumb to occlude the T piece port during pre-use checks and resuscitation. Disposable gloves or finger cots can be worn.

Use the T piece cap to occlude the T piece port on a longer-term basis where free flowing facial oxygen can be given to an infant patient breathing normally.

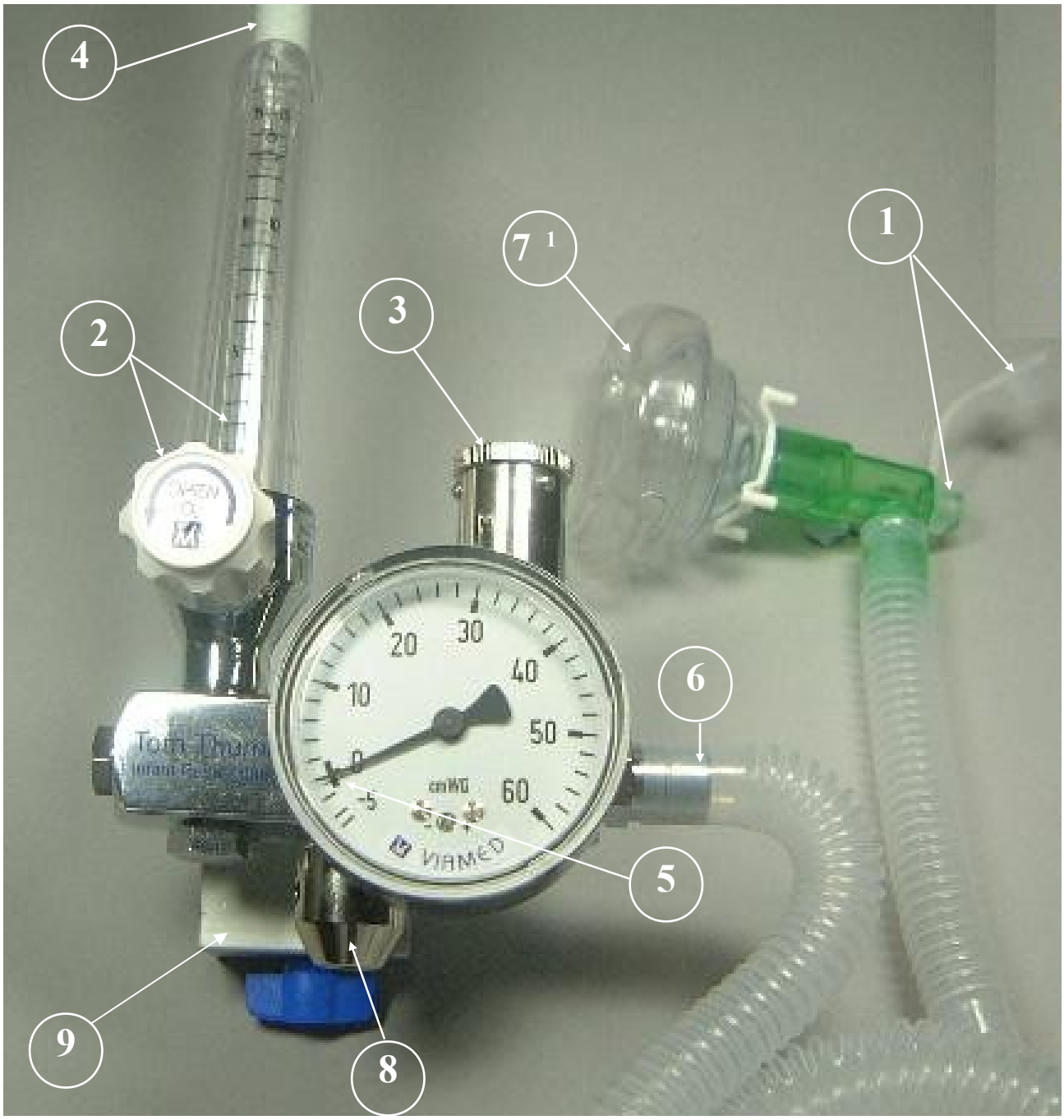
Oxygen leaving the mask can be used to flow over the face of the patient; use the mask in the vicinity of the infants face to produce an oxygen-enriched mixture to breathe (follow the hospital protocols for this technique).

Important.

Do not apply the mask to the patient with the T piece port capped or permanently occluded under any circumstances.

NB. A "T" piece with a fixed or adjustable PEEP facility can be used.

4. TT490-15.



Important.

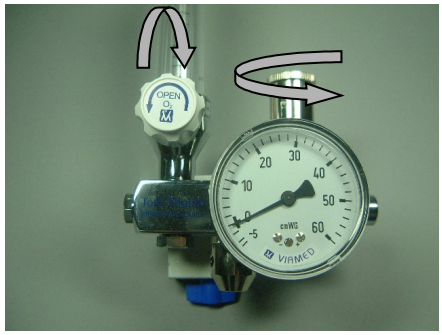
For use by qualified and trained personnel only.
Use flow rates within the range of the flowmeter.
Adjust outlet pressure after altering the flow rate.
Do not attempt to adjust the safety valve ⑧.
Recommended O_2 inlet pressure of 4 bar.

① "T" Piece Port
② 0-15Lpm Flowmeter
③ Adjustable Valve
④ Inlet O2 Hose
⑤ Pressure Gauge
⑥ Patient Tubing
⑦ Patient Facemask
⑧ Precision Valve
⑨ Rail Clamp

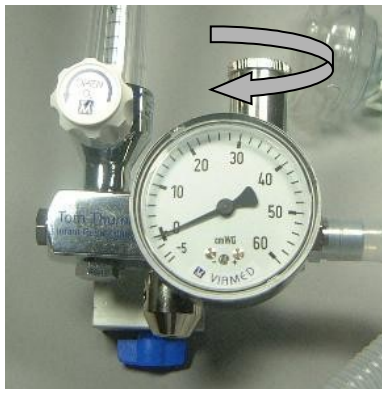
2.1 Pre-use Checks (TT490-15).

- Uncap the T piece port ①.

- Connect the flowmeter inlet ④ to the O_2 supply.
- Make sure the flow of gas is turned off, and turn the adjustable valve control ③ to minimum (fully counter clockwise).



- Check that the pressure gauge ⑤ reads zero (within the black band on the gauge). If not, the Tom Thumb requires servicing.
- Connect the patient tubing ⑥ to the Tom Thumb outlet but do not apply the mask ⑦ to the patient.
- Set the flowmeter to the required flow rate.
- Occlude the mask and the T piece port. Gradually turn the adjustable valve control clockwise until the required outlet pressure is shown on the pressure gauge (*).



- The Tom Thumb is now ready for use.

2.2 Guideline for Use during Resuscitation (TT490-15).

- Follow the pre-use checks and set the required flow rate and outlet pressure.
- Apply the mask to the patient and cover the T piece port to inflate the patients' lungs at the set flow rate and pressure (*).
- Uncover the T piece port and allow the patients lungs to deflate (*).
- Repeat steps 2 & 3 as necessary during the resuscitation of the patient (follow the hospital protocols for resuscitation).

(*) Use the thumb to occlude the T piece port during pre-use checks and resuscitation. Disposable gloves or finger cots can be worn.

Use the T piece cap to occlude the T piece port on a longer-term basis where free flowing facial oxygen can be given to an infant patient breathing normally.

Oxygen leaving the mask can be used to flow over the face of the patient; use the mask in the vicinity of the infants face to produce an oxygen-enriched mixture to breathe (follow the hospital protocols for this technique).

Important.

Do not apply the mask to the patient with the T piece port capped or permanently occluded under any circumstances.

NB. A "T" piece with a fixed or adjustable PEEP facility can be used.

5. Frequently Asked Questions.

Q. Having carried out the pre-use checks and set flow rate and pressure required, in use the Tom Thumb delivers a greater pressure than that set?

A. Care should be taken that the T piece and mask are totally occluded when carrying out the pre-use checks. Any gas leaking from the mask or T piece will cause a higher pressure to be delivered in use when the seal around the mask and T piece are better. The mask should be firmly pushed against a solid smooth surface to completely occlude it during the pre-use checks. When the Tom Thumb is installed in resuscitation cabinet, do not use the mattress / bedding to attempt a seal at the mask as gas will escape causing an apparent over delivery of pressure than that set. When correctly occluded, a steady hiss of gas can be heard from the adjustable valve.

Q. In use, the Tom Thumb pressure gauge needle rises to the set pressure but the patients' lungs are not inflating?

A. The Tom Thumb is delivering oxygen to the patient at the displayed pressure. If the lungs are not inflating, the patients' airway may be blocked or the mask incorrectly positioned.

Q. In use, the Tom Thumb pressure gauge needle does not reach the set pressure and the adjustable valve cannot be heard releasing gas?

A. There is a leak in the circuit. This is most likely to be due to not achieving a good seal between the mask and the patient but may also to be due to not occluding the Tee piece port correctly. A physical leak such as a rupture within the circuit is unlikely to be the cause, as this would have prevented the pre-use checks being completed successfully. If in any doubt, carry out the pre-use checks again.

Q. The tubing is longer than required. Can it be cut to size?

A. Yes. The tubing has regularly spaced 'bubbles' between corrugated sections and the tube can be cut at these points if necessary.

Q. The mask supplied is too big for some infants. Can we use different masks?

A. Yes. The T piece has Standard International "15mm" anaesthetic cone connector fittings, and masks from other manufacturers can be connected in place of the standard mask.

Q. Can I give less than 100% oxygen?

A. Yes, a twin oxygen and air system is available.

6. Company Details.

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Appendix "A"

UK RESUSCITATION COUNCIL RECOMMENDATIONS

When a baby is being resuscitated for the first time at birth, the first task is to get air to enter the previously fluid filled lung. To achieve this, the first 3-5 mask inflations should use a pressure of 30cm H_2O and each inflation should last 2-3 seconds. Once air has entered the lung and the chest starts to move (a transition that is nearly always marked by a rise in the heart rate to something in excess of 100 bpm) most babies will start to breathe for themselves, and further resuscitation is not usually needed. If further breathing support does seem appropriate, it is usually only necessary to use a pressure of 20 cm H_2O, and to apply this pressure for about one second 20-30 times a minute.

In the very preterm baby, surfactant deficiency may make the lung harder to expand at birth. Excessive or abruptly applied pressure could, however, also damage the lung because these tissues still lack much of their normal elastic support. It could also cause expansion to become very uneven. For this reason resuscitation needs to be gentle and should not be rushed. Using an unnecessarily high gas flow can cause a very abrupt, and potentially damaging, rise in pressure. A relatively low gas flow should suffice if there is a reasonably good air seal between the facemask and the face.

In addition it is even more important to reduce the pressure used top support breathing in the preterm baby than it is in the term baby, once the lung has opened up. Conversely, however, much more care may need to be taken to ensure that some air stays in the lung at the end of each breath. Blood will return to the left side of the heart without picking up any oxygen if this does not happen, and what surfactant there is will be used up even more quickly than usual. The best way to make sure that this does not occur is to keep the pressure applied from falling below 5cm H_2O at the end of each breath by attaching a variable (or fixed) Positive End Expiratory Pressure (PEEP) device to the "T" Piece Port. A Pulse Oximeter may help to document the heart rate and also show how much oxygen is necessary. The early use of Constant Positive Airway Pressure (CPAP) using nasal prongs may help to prevent progressive de-aeration of the lung in babies who continue to require significant amounts of oxygen, twenty minutes after birth.

Babies, who stop breathing long enough to require resuscitation later in the neonatal period, do not need to be resuscitated with a pressure as high as 30 cm H_2O if either lungs are relatively normal. Indeed, sustained ventilation with a pressure as high as this will eventually wash enough carbon dioxide out of the body to remove the body's main stimulus to breathing. While the resultant apnoea is not dangerous, it can cause diagnostic confusion. In the preterm baby there is even more reason to avoid an unnecessarily high pressure, because this risks causing traumatic interstitial lung emphysema and / or a pneumothorax. Excessive ventilation will also eventually wash enough carbon dioxide out of the blood to cause cerebral vasoconstriction, a response that could, if sustained, cause lasting brain damage.