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SmartMan has two infant products. Each is designed to provide real time feedback for improved training of CPR skills. These manikins cannot be intubated. They are BLS manikins. However with that being said, because infants often suffer from breathing difficulties, these products have several effective activities to train students in how to provide effective ventilations to infants.

SmartMan Baby. This is designed to simulate a baby from about 1 month to 12 months of age.

SmartMan Neonate. This is designed to simulate a new born natural term birth to 1 month of age.

These products have an excellent look and feel. They can easily fit onto the arm and can be used to practice the two thumb method for chest compressions.

1.0 DESCRIPTION

1.1 The hardware

SmartMan Infant® is a CPR training manikin system for the simulation of realistic and correct anatomical conditions during cardiopulmonary resuscitation by means of insufflation and external cardiac compression. It is designed to provide digital feedback when connected to a PC computer. It provides accurate feedback on rate, depth and release of the chest along with rate, volume, and timing for ventilations.

The physical manikin provides an exceptionally lifelike representation of the human anatomy, particularly of those features important to training in modern resuscitation techniques.

It features a unique, Ambu patented hygienic system for performing mouth-to-mouth resuscitation under which each trainee gets his own face piece and head bag, thereby minimizing any risk of cross-infection between trainees. With the special hygienic system, disassembly and internal cleaning and disinfection are rendered unnecessary both during and after training.

1.1.1 Operating principles

See **1** on the picture below. When air is blown through the mouth and nose of the face piece (1.1), the head bag (1.2) fills, thereby displacing the air in the skull (1.3) through the valve (1.4) which is open when the head is in the neutral position. The valve closes if there is the head is pressed to far forward or if it is extended. When in the correct position air will pass through the neck tube (1.5) into the lung bag (1.6) which expands and elevates the chest. If insufflation takes place too quickly and/or the air volume is too high, the stomach valve (1.7) will open and allow air to flow into the stomach bag (1.8), thereby distending the stomach region.

When external cardiac compression is performed, the chest is squeezed and an expanding pad (1.9) will cause the chest to refill. External cardiac compression must be concluded before starting insufflation to minimize the risk of stomach inflation. This applies to SmartMan Infant as well as to real babies.

By operating the on/off slider (1.10) on the side of Ambu Baby, the airway can be blocked to simulate airway obstruction irrespective of the position of the head.

Arms and legs are permanently attached and cannot be removed.

1.1.2 Hygienic system

The head bag is placed into the skull and the face piece is fitted. The Face Piece and the Head Bag are connected to a Holder (see picture below) Insufflation has just started (see ②).

Insufflation is concluded and expiration has just started (see ③).

Note: For the hygienic system to function as intended, each trainee must use his own face piece and head bag during training.

1.1.3 Preparation for training

SmartMan Infant manikin is supplied in a soft, nylon carrying case. Unpack the manikin and place it in position for training, for example on a table.

Mounting the Head bag into the Holder and the Face piece
(See pictures below of disassembly to clarify)

Roll both sides of the bag against each other or fold it as shown (see ④).

Insert the head bag as shown (see ⑤). Fold the edges sideways. Make sure that the neck of the head bag is bented over the bushing, that the sides of the bag which extend from the hole are evenly distributed around the opening so that the Holder will fit tightly and evenly and air can be blown into the head (see ⑥ and ⑦).

Line the Face Piece up so that the mouth is roughly in the correctly position. Fit the Face Piece onto the Holder by sliding the edges over the Holder. Once firmly onto the Holder, push the nose as shown on the photo (see ⑧).

1.1.4 Instruction

The Ambu Baby is designed to meet all the training recommendations of the American Heart Association (AHA). However, it is recommended that instruction should be based on the techniques and provisions applicable in jurisdiction where instruction takes place. Instruction may be given in correct head movement. The airway will be obstructed on incorrect position.

The illustration shows insufficient extension of the head.

The airway is closed (see ⑨).

Correct head position. The airway is open (see ⑩).

Excessive hyperextension. The airway is closed (see ⑪).




The brachial pulse can be felt on the right upper arm. It is activated when the instructor squeezes the bellows (see ⑫).

Correct tilting of the head during insufflation (see **15**). The thorax movement is clearly visible during insufflation and expiration. The expiratory air can be felt and heard. There is no risk of cross-infection since the hygienic system ensures that the expiratory air is the same as that insufflated by the trainee in the head bag.

Chest compression can be practiced according to current standards (AHA) (see **17**)

1.1.5 Removal of Face Piece, Holder and Head bag

The Face Piece attaches to the Holder which also holds the Head Bag in place. The holder makes a tight seal with the Face Piece and with the Head Bag. With the new digital SmartMan Infant it is important that this seal is tight and that it does NOT leak air.

The Face Piece +	The Holder +	The Head Bag
<p>This fits snugly onto the Holder. Pull up one edge first and then remove the rest.</p> 	<p>This is the connector for the Face Piece and the Head Bag.</p> 	<p>This is held tightly in place by the holder. Wiggle to take out; push firmly to reset into place.</p> 

1.6.1 Remove Face Piece

Pull the mask upwards and pull one edge off until it is free of the edge of the holder (see above). Then pull the remain off of the holder. Be careful not to rip the back of the face piece.

1.6.2 Remove Face Piece and Head Bag Holder

Firmly grip the holder and pull it out. You may have to twist this from side to side.

1.6.2 Remove Head Bag

Grip the bag on each side without closing the opening. Pull the bag slowly upwards, twisting it from side to side if necessary to ease removal (see **19**).

1.1.6 Cleaning and disinfection

No internal cleaning and disinfection is necessary.

1.1.7.1 Cleaning of Head bag

Each trainee has his/her own disposable head bag which should always be discarded after training.

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1.1.7.2 Cleaning of Face piece

The face pieces can be reused after cleaning and disinfection.

1.1.7.3 Cleaning of Holder (For Face Piece and Head Bag)

Wash with soap and water. Wash items in warm water, max. 65°C, using a mild detergent. Rinse thoroughly in clean water to remove all traces of detergent and allow to dry before storing.

Warning: This must NOT be cleaned with anything except soap and water.

1.1.7.4 Manual washing

Rinse the face pieces in clean water. B. Wash items in warm water, max. 65°C, using a mild detergent. C. Rinse thoroughly in clean water to remove all traces of detergent and allow to dry before storing.

1.1.7.4 Machine washing

The face pieces can be washed automatically. Apply a normal amount of detergent and choose a washing programme with a maximum temperature of 65°C. Allow items to dry before storing.

1.1.7.5 Disinfection

After cleaning the face pieces (do NOT do this with the HOLDER), disinfection can be performed as follows: A. Place the items in a sodium hypochlorite solution with minimum 500 ppm freely accessible chlorine (1/4 of a cup of liquid household bleach per gallon (approx. 4 litres) of tap water for 10 minutes). This solution must be fresh and should be discarded after use. B. Place the items in a 70% ethylalcohol solution for minimum 30 minutes. C. Chemical disinfection can also be performed using recognised disinfectants suitable for use with polyvinylchloride (PVC). The supplier's directions on dosage and disinfection period should be closely followed. Always rinse the face pieces in clean water after disinfection and allow to dry before storing.

1.1.7 Cleaning of skull, neck, body, arms and legs

The skull, neck, body, arms and legs of the Ambu Baby should be wiped over with a cloth moistened in a mild detergent and then wiped over with a cloth moistened in clean water. The training manikin must not be submerged in water nor should water be allowed to enter the internal parts. Marks on the Ambu Baby left by lipstick or ball pen can penetrate the material and should therefore be removed as quickly as possible using alcohol.

1.1.8 Cleaning of clothing

The baby panties are made of 100% cotton and are washable in the usual way for such material at max. 60°C.

Warning: The face pieces must not be boiled, autoclaved or gas sterilized.

Warning: This must NOT be cleaned with anything except soap and water.

1.1.9 Specifications

Weight including carrying case: 2.5 kg (5.5 lbs)

Weight excluding carrying case: 1.8 kg (4 lbs)

Total length of manikin: 40 cm (approx. 16 inches)

Materials Parts Materials

Head	PVC, hard
Skin (body)	PVC, soft
Face piece	PVC, soft
Head bag	Polyethylene
Arms and legs	PVC, soft

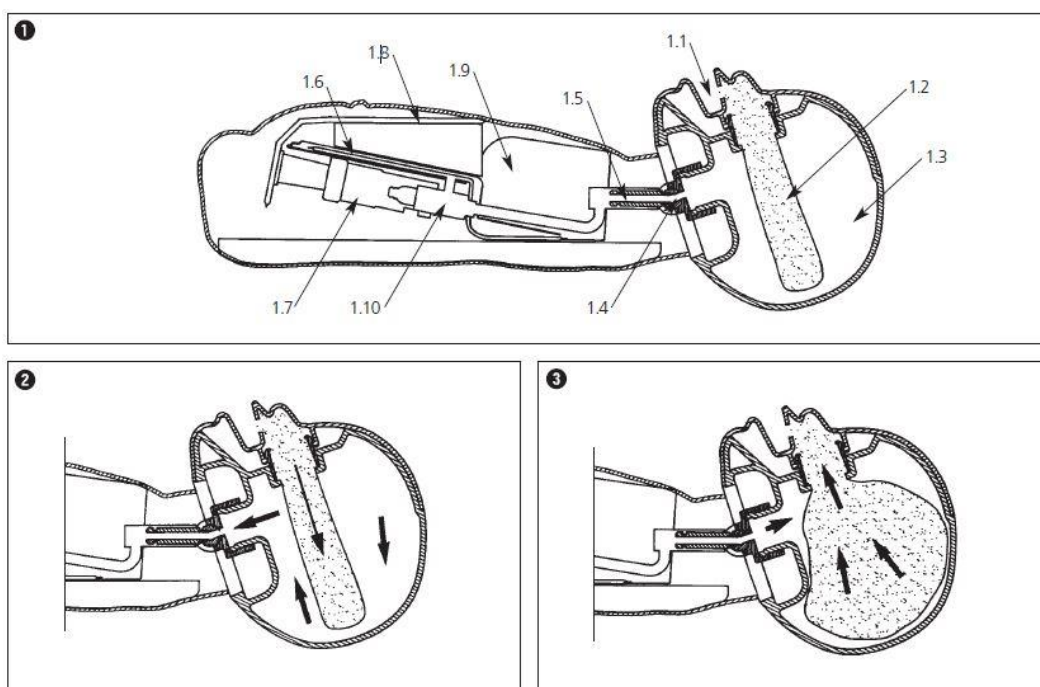
1.1.10 Accessories - see **20**

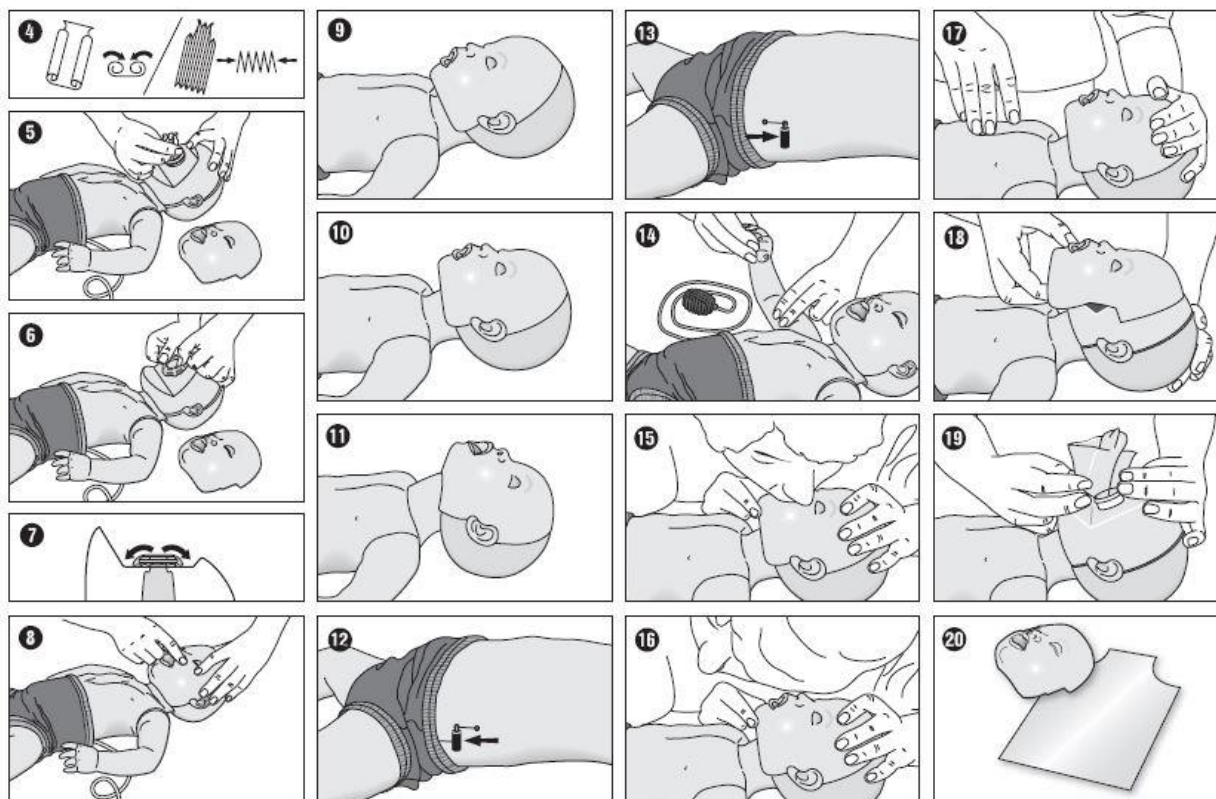
256 000 702 Head bag, set of 100

256 000 703 Face piece, set of 5

1.1.11 Reference Picture for Hardware

Numbers used in the text refer to the numbers in the following illustrations.





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