

Pediatric Prehospital Care Course

Lesson 8 Children with Special Health Care Needs

Children with special health care needs (CSHCNs) refers to children who have or are suspected of having a serious or chronic condition of:

- a) physical
- b) developmental
- c) behavioral, or
- d) emotional

health that require health-related services of a type or amount beyond that generally required by children (based on nat'l defn.).

FAQ's about CSHCNs

A technology-assisted child refers to those children who depend on medical devices to support bodily function.

Why is this Population Increasing?

- a) Increased survival rates from children suffering from critical injuries or disease.
- b) Advances in medical technology allow more children into the mainstream.
- c) More plentiful support services have decreased the time spent in hospitals for these children.

What is the Assessment Standard?

- a) Use Rapid First Impression and Initial Assessment Steps
- b) The baseline of these children may be different from others in their age group.
- c) Ask the family member or caregiver if there are deviations from this child's normal state.

Are there different Airway Considerations?

- a) Children with special needs are susceptible to airway obstruction.
- b) Technology-assisted children are at risk of device failure.

Are there different Breathing Considerations?

Children with congenital heart disease or chronic illness may be unable to compensate for even mild respiratory distress.

Are there different Circulation Considerations?

- a) Signs of hypoperfusion may be masked because the baseline heart rate of the child may be accelerated.
- b) Look for other signs including AMS.

CLASSIFICATIONS FOR TRANSPORTATION DECISIONS.

The following are examples of CSHCN that fall into the 'Always Urgent' category.

- a) Child who has *respiratory distress or signs of hypoperfusion*
- b) Transport ASAP with oxygen.
- c) Additional assessment while en route.

Delayed Mental Development

The following are examples of assessment concerns for CSHCN.

- a) Use a sensitive approach:
- b) Ask for the child's name and use it.
- c) If necessary, use "special child" rather than terms like "retarded" or "slow."

Ask the Parents/Caregivers

Gather baseline information from the primary care givers to determine the child's normal abilities and behavior in the following areas:

- a) mental status
- b) interaction with parents and strangers
- c) verbal abilities
- d) ability to sit, stand, and walk
- e) muscle tone and strength

Are there differences from normal abilities and behaviors now?

Were these changes the primary reason for calling EMS?

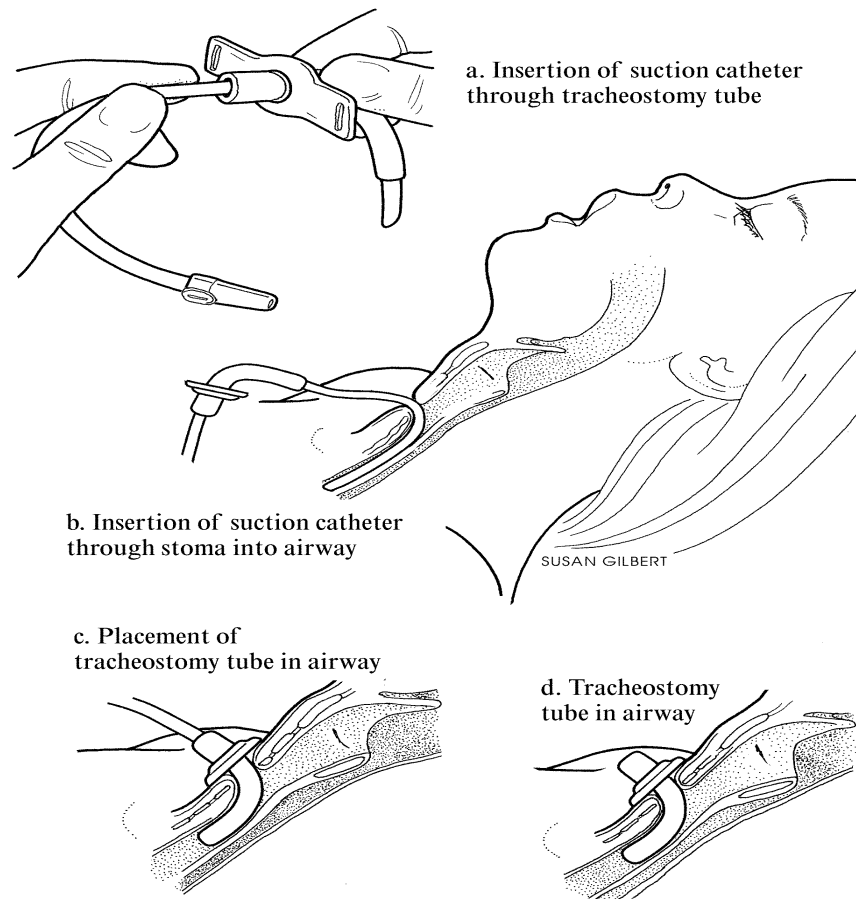
Prehospital Care Providers must be prepared to deal with the at home technology that CSHCN make use of.

At Home Technology includes:

- a) Tracheostomy Tubes
- b) Home Ventilators
- c) CPAP Devices
- d) Central Intravenous Catheters
- e) Pacemakers
- f) Feeding Catheters
- g) CSF Shunts
- h) Colostomies and Ileostomies
- i) Tracheostomy

TRACHEOSTOMY TUBES

Figure 56: Tracheostomy Tube Placement



What is a Tracheostomy?

A surgical opening into the trachea through which a tracheostomy tube can be passed. The child then breathes through this opening.

What are the reasons for a Tracheostomy?

To bypass an airway obstruction caused by birth defect, surgery, or trauma.

To allow for long-term ventilator use.

To access and remove excessive secretions.

TRACHEOSTOMY TUBES

Types of Tracheostomy Tubes

1. **Single Cannula** Tracheostomy Tube

Used on all newborns and most pediatric patients.

Has one single passage used for both airflow and suctioning.

2. **Double Cannula** Tracheostomy Tube

Features a removable inner cannula that fits inside an outer cannula.

Inner cannula must be in place to ventilate the patient

Outer cannula keeps the stoma open while the inner is removed for cleaning.

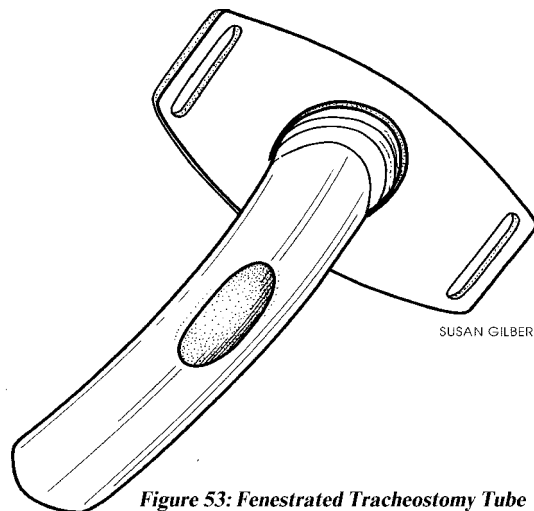


Figure 53: Fenestrated Tracheostomy Tube

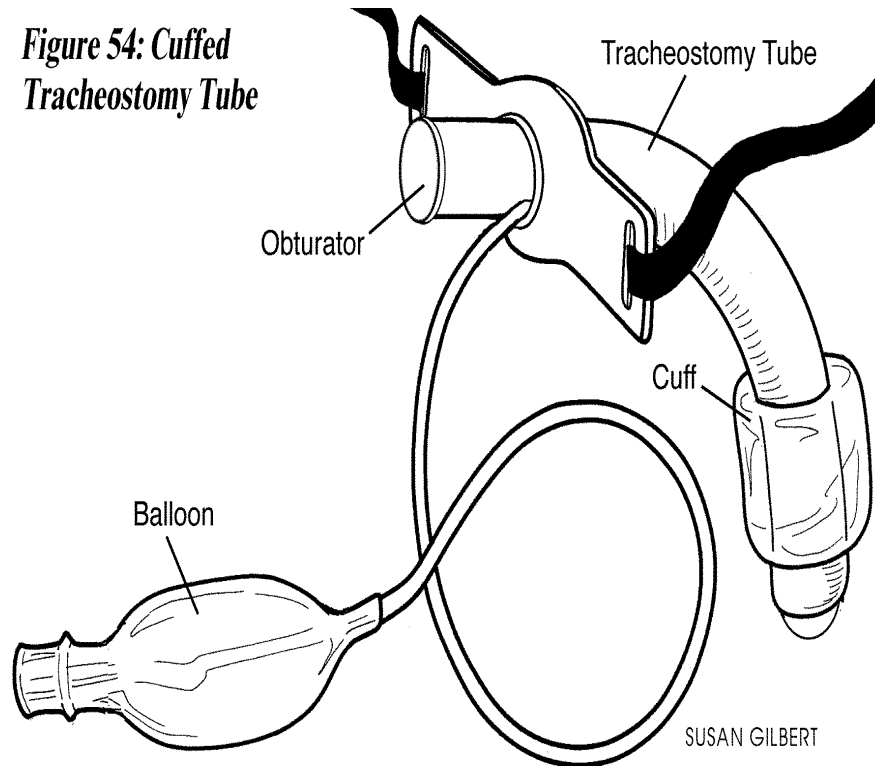
3. **Fenestrated** Tracheostomy Tube

Allows the child to breathe through either the tube or the mouth.

Teaches the child to breathe through the mouth and allows for speech.

Tracheostomy Tubes

Figure 54: Cuffed Tracheostomy Tube



4. Cuffed Tracheostomy Tube

Cuffed tubes are used to eliminate or reduce airflow through the mouth and nose.

Cuffs may be either foam or balloons.

Used for adults or older children.

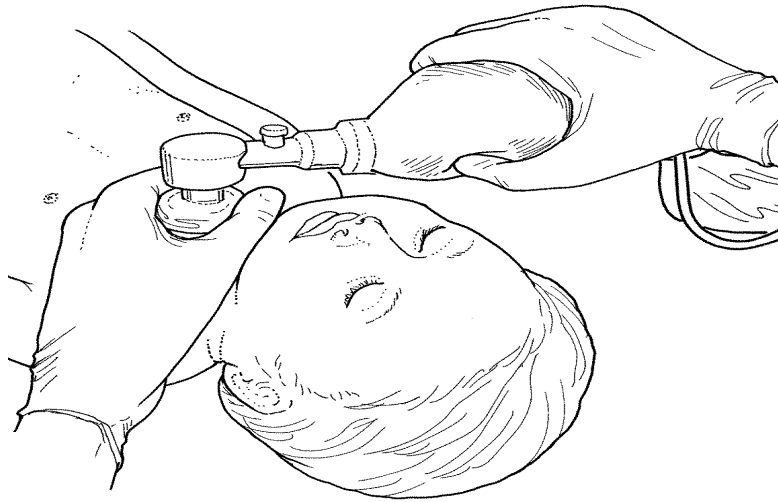
TRACHEOSTOMY TUBES

Tracheostomy Emergencies

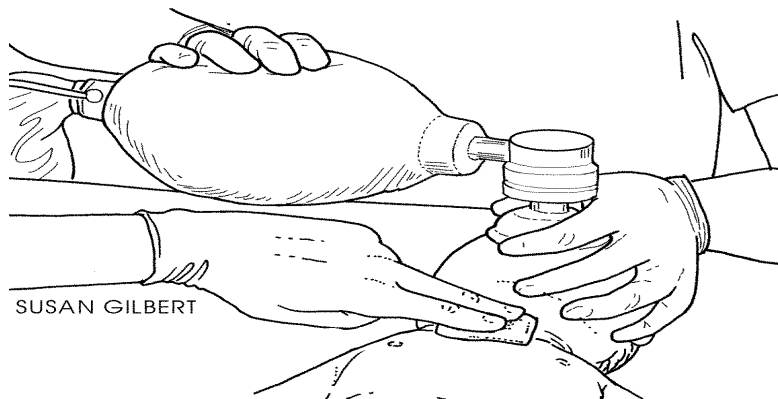
EMTs may be called on to respond to children with tracheostomies for the following reasons:

- a) obstruction of the tube
- b) displacement of the tube
- c) psychological care of the patient or care giver

Figure 58: Ventilation through Stoma



a. Assisted ventilation through stoma; patient's mouth closed



b. Assisted ventilation through mouth and nose; stoma covered

TRACHEOSTOMY TUBES

Tracheostomy Emergencies – Ventilatory Management

To correct respiratory distress for a patient with a tracheostomy:

- a) place a rolled towel under the child's shoulders,
- b) make sure the tracheostomy tube is properly seated and the obturator/decannulation plug has been removed.
- c) Attempt assisted ventilation through the tracheostomy tube.
- d) If the child is on a home ventilator, remove it and manually ventilate the child with a bag-valve device.

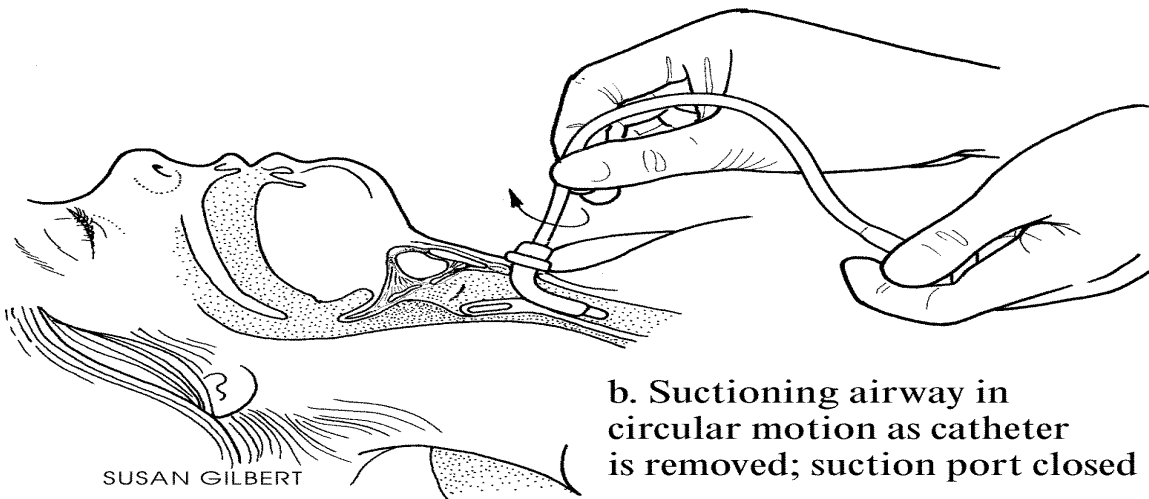
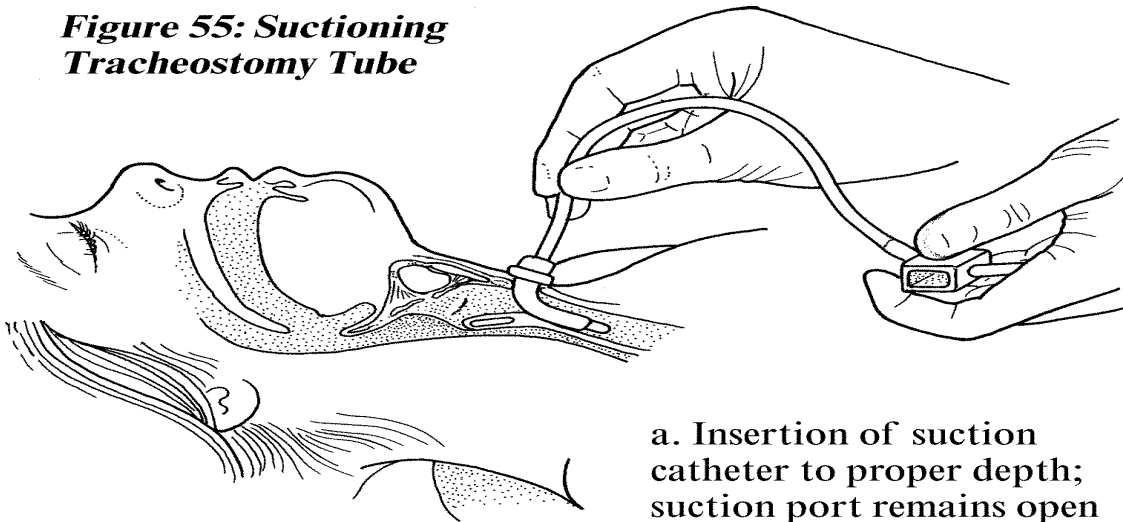
Tracheostomy Emergencies – Suction Management

- a) Ask the parent or caregiver for the proper supplies.
- b) Select a catheter small enough pass through the tube.
- c) Set the suction at 100 mm/Hg or less.
- d) Pre oxygenate the patient.
- e) Loosen secretions with normal saline.
- f) Insert catheter 2 inches into the tube.
- g) Suction for no more than 10 seconds while removing the catheter.
- h) Monitor pulse and condition.
- i) Attempt to remove/ replace the tube
- j) Obtain a replacement tube.
- k) If the existing tube has a balloon cuff, deflate it.
- l) Cut the ties that hold the tube in place and remove the tube.
- m) Insert the tube with the curved end pointing down,
- n) Confirm that the tube is positioned properly.
- o) Evaluate the child's respiratory status.
- p) Perform ventilations with a bag valve mask over the stoma or the mouth.

Remember children with tracheostomies often have asthma. Always treat according to local protocol.

TRACHEOSTOMY TUBES

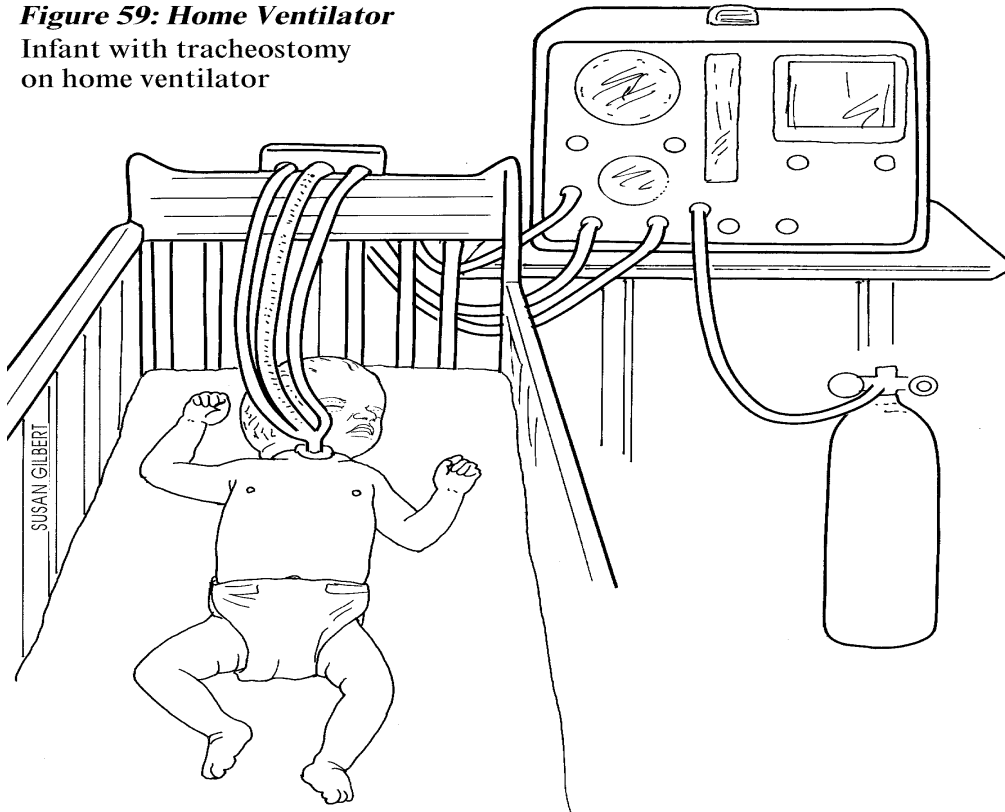
**Figure 55: Suctioning
Tracheostomy Tube**



Home Ventilators

Children who depend on home ventilators have a problem with their respiratory drive or respiratory effort.

Figure 59: Home Ventilator
Infant with tracheostomy
on home ventilator



Home Ventilators

Control Settings

- a) breathing rate
- b) tidal volume
- c) FIO₂
- d) Peak Inspiratory Pressure (PIP)
- e) Positive End Expiratory Pressure (PEEP)

Types of Home Ventilators

There are two types of home ventilators:

- a) Pressure cycled ventilators
- b) Volume ventilators

Home Ventilators usually operate in two Modes

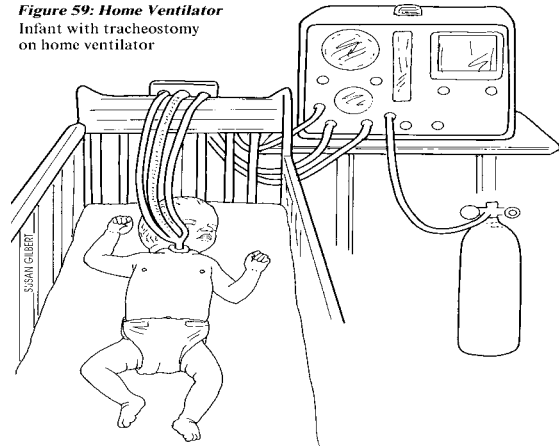
- a) Intermittent Mechanical Ventilation (IMV)
- b) Continuous Mechanical Ventilation (CMV)

Home Ventilator Emergencies –Management

Possible causes of emergencies involving home ventilators include:

- a) equipment failure
- b) problems with the oxygen supply
- c) an obstruction in the ventilator tubing
- d) an obstruction in the tracheostomy tube
- e) a medical condition

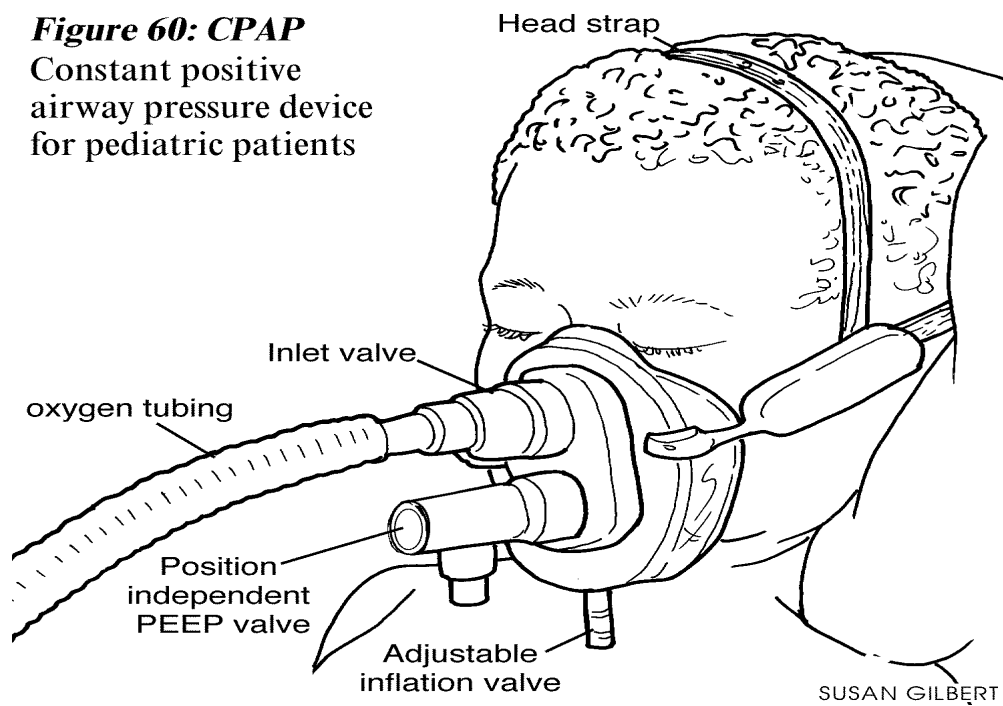
Figure 59: Home Ventilator
Infant with tracheostomy
on home ventilator



Constant Positive Airway Pressure AKA CPAP

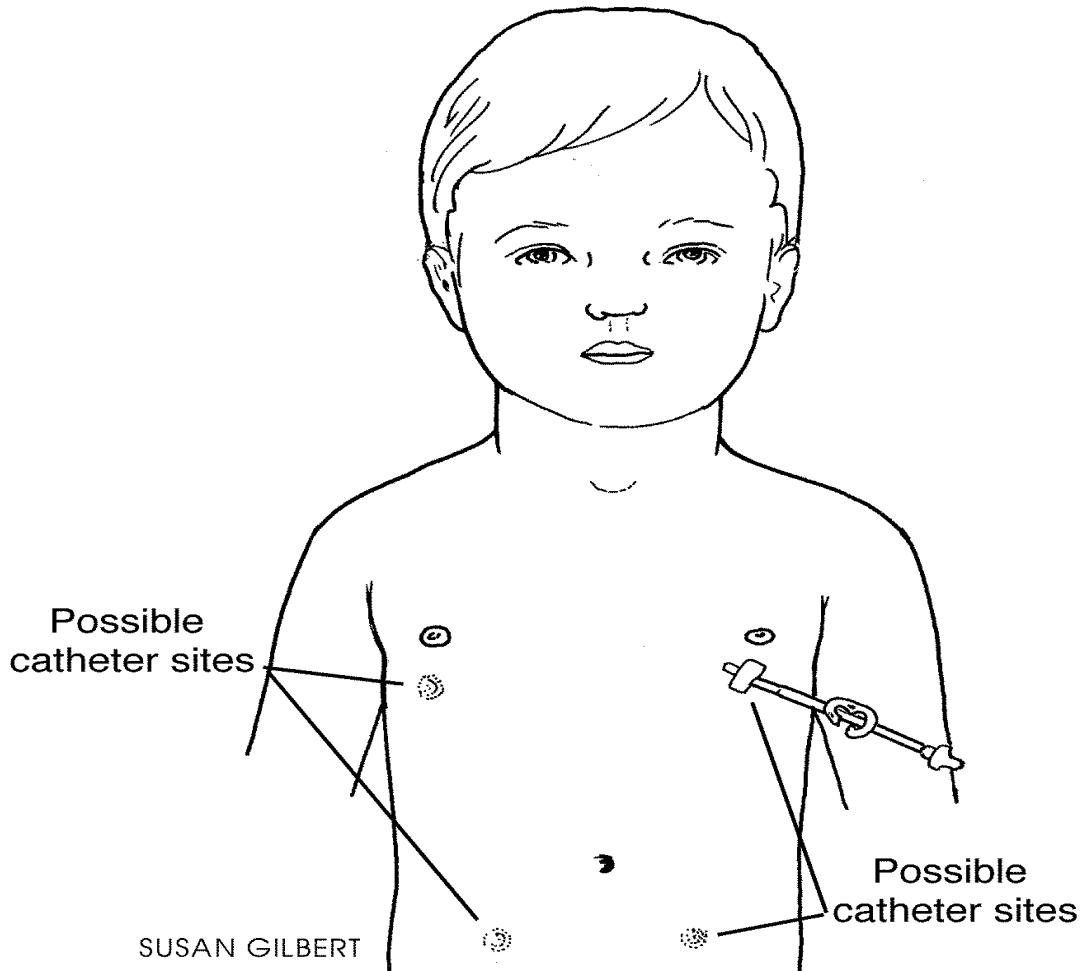
A mask covers the child's mouth and nose, providing constant pressure, ensuring an open airway.

Figure 60: CPAP
Constant positive
airway pressure device
for pediatric patients



Central Intravenous Catheters

Figure 63: Central Intravenous Catheters
Sites for internal and external intravenous catheters



Central Intravenous Catheters

Types

- a) Broviac Catheters
- b) Hickman or Mediport Catheters

Purpose

- a) Used to deliver nutrients or special medications into a central line.
- b) Located on the chest, neck, groin, or arm.

Central Intravenous Catheters Emergencies and Management

- a) Bleeding or broken catheter
- b) Obstructed
- c) Fever

Solutions

Controls bleeding with direct pressure clamp catheter end and transport.

Request Advanced Life Support to clear obstruction.

Do not delay transport for any reason.

Pacemakers

What is it?

Pacemakers regulate heart rate. A pacemaker is needed if the natural heart rate is not fast enough to ensure adequate perfusion.

Types of Pacemakers

- a) Demand
- b) Constant
- c) Antiarrhythmia

Pacemaker Emergencies –Management Solutions

Dislodged Leads or Broken Leads

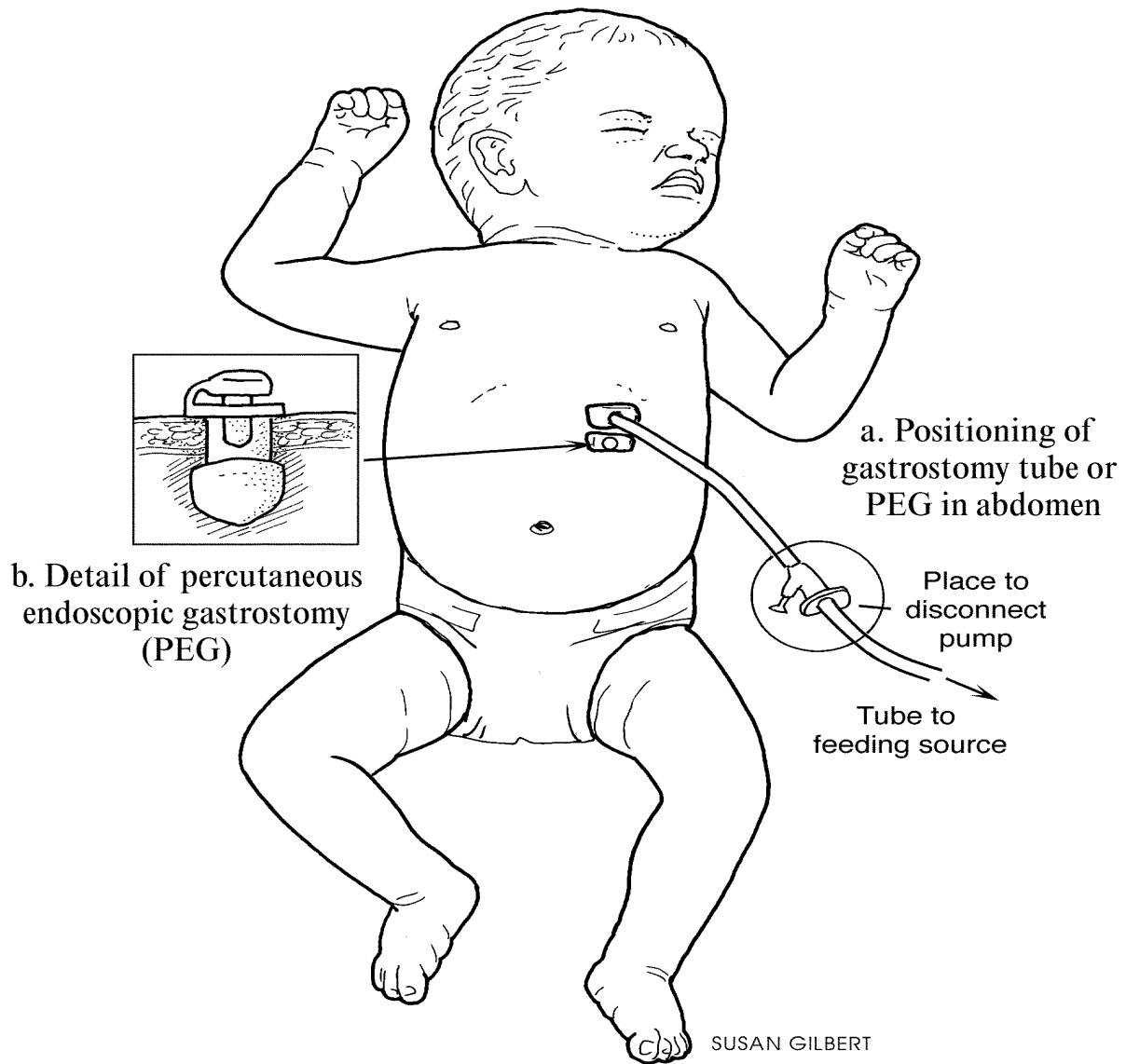
Pacemaker failure means you need a new one regardless of cause.

Treat symptoms as necessary, rapid transport.

Transport immediately, request ALS back-up, treat for shock as indicated.

Feeding Catheters

Figure 61: Gastrostomy Tube and PEG



Feeding Catheters

A feeding catheter provides a route for nutritional support when the child is unable to take food by mouth.

- a) Surgical feeding catheters are used for long term support of the child.
- b) Non-surgical feeding tubes are used for temporary support of the child.

Surgical Types

- a) Gastrostomy Tube(GT)
- b) Jejunostomy Tube(JT)
- c) Gastrostomy Button

Non- Surgical Types

- a) Nasogastric Tube (NGT)
- b) Nasojejunal Tube (NJT)
- c) Orogastric Tube (OGT)
- d) Orojejunal Tube (OJT)

Common Problems for feeding tubes.

- a) Bleeding
- b) Leaking
- c) Broken
- d) Dislodged

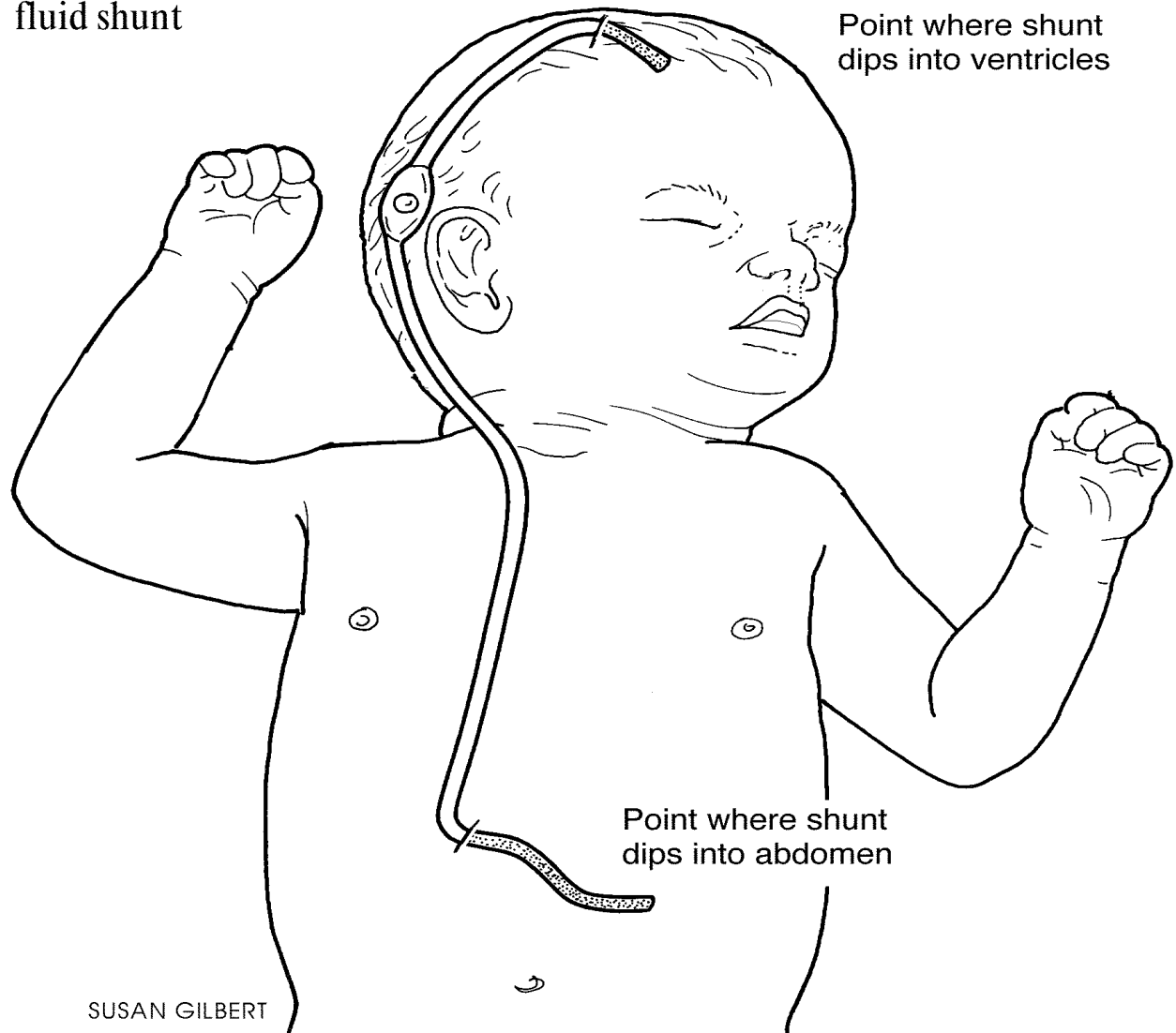
Solutions

Control bleeding at site, treat skin irritation, and transport.

As always, monitor your patient and treat accordingly.

CSF SHUNTS

Figure 64: CSF Shunt
Placement of cerebrospinal
fluid shunt



CSF SHUNTS

What is it?

A special catheter to drain cerebrospinal fluid (CSF) from the brain. It runs under the skin from the skull to the chest or abdomen.

Potential warning signs of CSF Shunt problems:

- a) Altered mental status
- b) Listlessness
- c) Increased sleep
- d) Nausea or vomiting
- e) Fever
- f) Headaches
- g) Difficulty walking

CSF Shunt Emergencies –Management Solutions

Initiate transport and continually assess and reassess ABCs.

Urgent issues: request ALS, if available, but do not delay transport.

- a) Periods without breathing
- b) Seizures
- c) Rapid AMS

COLOSTOMIES AND ILEOSTOMIES

Figure 65: Infant Patient with Colostomy



SUSAN GILBERT

COLOSTOMIES AND ILEOSTOMIES

What is it?

A portion of the small or large intestine is attached to a surgical opening in the abdominal wall and a bag is placed to collect digestive waste.

Congenital Heart Disease

What is it?

Children may be born with structural defects of the heart:

They may have heart valve problems or their arteries don't function correctly.

Examples of heart disease includes but is not limited to:

- a) Cyanotic heart disease
- b) Heart doesn't fire properly
- c) Congenital Heart Disease

EMT considerations:

These children may have low blood oxygen levels and can develop hypoxia and/or hypoperfusion (shock). This is severely life threatening for these types of patients.

Children with irregular pulses should be rapidly transported and constantly monitored

Children with Mobility Problems

What is it?

Mobility problems may be caused by spasticity or paralysis.

Spasticity is a condition where muscles and tendons become tight, restricting movement of joints and extremities.

Paralysis is the inability to move a portion of the body.

Children with Chronic Illnesses

Special Considerations

The child's baseline vitals may be different from others his/her own age.

The child may have a decreased tolerance.

The child may have received significant medical care prior to EMS' arrival.

The parent/caregiver can provide valuable information.

Children with chronic illness may have medical emergencies for other reasons:

They may experience an unrelated illness or a traumatic injury.

They may suffer a sudden worsening of the underlying chronic condition.

Summary

CSHCNs - Technology Assisted children present unique challenges for EMTs.

Modify RFI and Initial Assessment steps

Focus on any condition of the airway, respiratory or circulatory system.

Take nothing for granted.

Parent/caregiver is key in assessment.

CSHCNs Handout

Overview of Tracheostomy Management Actions

If a child with a tracheostomy experiences respiratory difficulties, immediately perform the following steps:

Place a rolled towel under the child's shoulders (this will help you open and assess the airway).

Make sure the tracheostomy tube is properly seated and the obturator has been removed (in the case of a fenestrated tube, make sure the decannulation plug is removed).

If these steps do not improve the child's condition, attempt assisted ventilation through the tracheostomy tube (in ventilator-dependent children, disconnect the tracheostomy tube from the home ventilator and attach it to the bag-valve device).

If there is no improvement, inject sterile saline and attempt to suction the tracheostomy tube.

If there is no improvement, attempt to remove and replace the tracheostomy tube.

If there is no improvement, or if tracheostomy tube replacement is not possible, attempt to perform bag-valve-mask ventilation directly over the stoma or to the patient's mouth while blocking the stoma.

CSHCNs

Medical Devices: Common Problems and Solutions		
Device	Problem	Action
Tracheostomy	Obstruction	Attempt assisted ventilation with high-concentration oxygen Attempt to suction Change tracheostomy tube Ventilate through stoma Transport
Tracheostomy	Dislodged	Replace tracheostomy tube Provide assisted ventilation with high-concentration oxygen through stoma Transport
Home ventilator	Respiratory distress	Ask parents to check whether ventilator is functioning properly Assist in adjustment of ventilator Assess tracheostomy for obstruction Remove patient from ventilator and provide assisted ventilation
Pacemaker	Failure	Assess heart rate and perfusion Treat for shock Request ALS backup Provide urgent transport
Central intravenous catheter	Dislodged or damaged	Apply direct pressure to stop bleeding Clamp or tie exposed catheter to prevent further blood loss Assess and treat patient for hemothorax and shock Transport
Central intravenous catheter site	Signs of infection at site	Treat as potentially serious infection Transport
Oral or nasal feeding catheter	Dislodged	Remove catheter Have patient seek medical attention
Surgically placed feeding catheter	Dislodged	Transport promptly