

TRAINING BULLETIN

V-VAC HAND POWERED SUCTION UNIT

TABLE OF CONTENTS

- I. INTRODUCTION**
- II. REVIEW**
 - A. UPPER AIRWAY ANATOMY
 - B. BASIC LIFE SUPPORT AND CARDIOPULMONARY RESUSITATION (CPR) PROCEDURES
- III. V-VAC HAND POWERED SUCTION UNIT**
 - A. DESCRIPTION AND USE
 - B. STORAGE
 - C. PRECAUTION
- IV. CONCLUSION**

TRAINING BULLETIN NUMBER

V-VAC HAND POWERED SUCTION UNIT

TABLE OF CONTENTS

I. INTRODUCTION

II. REVIEW

A. UPPER AIRWAY ANATOMY

B. BASIC LIFE SUPPORT AND CARDIOPULMONARY RESUSCITATION (CPR) PROCEDURES

III. V-VAC HAND POWERED SUCTION UNIT

A. DESCRIPTION AND USE

B. STORAGE

C. PRECAUTIONS

IV. CONCLUSION

I. INTRODUCTION

The survival of a patient in need of airway assistance requires maintenance of a patent airway during administration of basic life support. Patients experiencing airway complications caused by emesis and aspiration of gastric contents have a high rate of morbidity and mortality. Proper airway management, including adequate suctioning, is essential during the care of a critically ill or injured patient.

The V-VAC Hand Powered Suction Unit (V-VAC) is designed to provide high volume suction in the emergency setting. The V-VAC is a valuable airway adjunct for use during airway maintenance. This training bulletin will address the proper use and storage of the V-VAC Hand Powered Suction Unit. This information should be used as a supplement to the V-VAC In - service training tape.

II. REVIEW

A. UPPER AIRWAY ANATOMY

The upper airway includes the nasal passages, mouth, tongue, epiglottis and pharynx. The nasal Nasoonarynx NM passages and mouth provide the primary and secondary pathways for Oropna entry of air into the Mouth system. The pharynx (throat) is a 5' inch tubular structure extending from the back of mouth to the esophagus and trachea. Automatic action of the pharynx permits the epiglottis, a thin leaf shaped valve which guards the opening to the trachea, to close over the larynx (voice box) when swallowing is initiated. This moves liquid and solids into the esophagus and away from the trachea.

B. BASIC LIFE SUPPORT AND CARDIOPULMONARY RESUSCITATION (CPR) PROCEDURES

Airway obstruction is a major complication and must be addressed immediately. The anatomical structure most commonly responsible for upper airway obstruction is the tongue. The foreign object which most often causes upper airway obstruction is food.

The basic life support steps are:

1. Establish unresponsiveness;
2. Position patient;
3. Open airway (head-tilt or chin lift);
4. Give two breaths;
5. Clear obstructed airway, reposition head, and give two breaths;
6. Establish pulselessness; and
7. Begin CPR.

C. SUCTION

Obstruction of the airway by fluids, blood, or emesis, requires clearing the airway. Suctioning the upper airway provides the best method of removal.

When preparing to suction:

1. Inspect equipment (e.g. daily inspection).
2. Position equipment at patient's head.
3. Open the patients airway.
4. Insert device into the mouth. Position V-VAC at the opening of the throat. Do not insert into throat.
5. Provide suction.

NOTE:

Whenever providing respiratory assistance or decontaminating respiratory equipment, prudent infection control practice suggests the wearing of disposable latex gloves and goggles.

III. V-VAC HAND POWERED SUCTION UNIT

A. DESCRIPTION AND USE

The V-VAC is a simple, effective hand powered suction device comprised of a handle and a single use 425 ml disposable pump cartridge. Fully assembled, the V-VAC weighs less than one pound and can be adjusted to provide suction pressure of approximately 120, 185, or 250 MM of Hg.

1. Frame

- A. Handle Frame
- B. Sliding Handle
- C. Stroke Stop

The frame consists of a sliding handle with an adjustable stroke stop. When the sliding handle is in the longest stroke position, each squeeze will cause up to 150 ml of fluid to be drawn into the cartridge. The most efficient way to suction is with a slow, steady stroke of one to two seconds in length.

a. Suction Pressure

Low suction pressures may be desirable for suctioning children or endotracheal tubes. The easiest way to produce low pressure is to slowly squeeze the sliding handle. This allows fluids to enter the cartridge while the cartridge is being expanded to offset, or fill, the "space" being created.

Low suction pressures may also be produced by limiting the expansion of the cartridge with the adjustable stroke stop. Adjusting the stroke stop towards the rear of the handle frame, limits the stroke length of the sliding handle and therefore suction pressure. The three stroke stop positions are:

<u>Position</u>	<u>Maximum Suction Pressure</u>
Front (nozzle end)	250 mm Hg
Middle	185 mm Hg
Rear	120 mm Hg

High suction pressure and extremely high liter flow rates may be produced with a very rapid squeeze of the sliding handle. The high liter. flow can make it difficult to maintain the intake valve seal. Only when high suction pressures are needed (e.g. when a clog is encountered) should the handle be squeezed rapidly. Very high suction pressures are rarely required.

b. Stroke Stop Adjustment

The black adjustable stroke stop is located on the top of the handle frame. Stroke stop adjustment may be accomplished by pulling up and back on the stroke stop, while squeezing the sliding handle. The stroke stop is then secured by sliding the stroke stop into position, pushing forward and pressing down until the stroke stop snaps into place.

2. Cartridge

- D. Cartridge
- E. One – Way Intake Valve
- F. Exhaust Valve with Filter

The disposable (425 ml) plastic pump reservoir cartridge includes a large diameter intake valve, a nozzle with increasing diameter, an exhaust valve with a removable non-bacteriostatic high flow filter element, and compressible bellows. Markings on the side of the cartridge allows estimation of the amount of fluid evacuated from the patient.

a. Cartridge Installation

1. Hold handle in left hand.
2. Hold cartridge in right hand.
3. Place cartridge at a right angle to the handle.
4. Insert the oval shaped hole firmly over the fitting on the handle frame
5. Pivot cartridge towards handle.
6. Snap into place.

b. Cartridge Removal

When suctioning is complete or cartridge is full, the cartridge should be removed and discarded.

Cartridge removal requires the V-VAC unit be held with the tip down. This position will keep the fluid in the cartridge below the level of the exhaust valve, and prevent fluid leakage from the valve.

Cartridge removal:

1. Reapply the protective cap over the intake valve;
2. Hold the V-VAC with tip pointed downward and away from body;
3. Push out cartridge with heel of palm;
4. Catch cartridge with other hand as it pops out; and
5. Pivot the cartridge to a right angle of the frame and remove.

Once the cartridge is removed, the frame and handle should be properly decontaminated prior to using the V-VAC on another patient.

3. Valves

The intake and exhaust valves are located on either end of the cartridge. The two valves work in sequence with one another. When the sliding handle is squeezed, the exhaust valve seals, and the intake valve opens, causing fluids (air, liquids, or both) to enter the cartridge. When the handle is released, the intake valve seals and, as the bellows compress, air is expelled through the exhaust valve.

a. Intake Valve

The large diameter one-way intake valve with slotted tip which is soft enough to prevent grabbing of the throat, yet firm enough to seal securely while suctioning. Intake and passage of particles, up to a half inch or 12 mm, are easily accommodated by the tip and plastic nozzle. The nozzle, which increases in diameter as it progresses towards the cartridge, is designed to decrease the likelihood of clogging.

b. Exhaust Valve with Non-Bacteriostatic Filter

The exhaust valve, located at the top rear section of the cartridge, allows air to escape during compression of the cartridge. The gray foam non-bacteriostatic filter, located inside the exhaust valve, removes moisture from the exhaust air. The filter does not prevent liquid from draining out of the exhaust valve; nor does it stop clogging if the sliding handle is squeezed and released while the filter is covered with fluid. Prevention of fluid expulsion and clogs may be accomplished by ensuring the nozzle tip is pointed downward at all times during operation.

4. Adapter Tip and Catheter Usage

An adaptor tip and a short 8" French Suction Catheter are provided for additional application. This catheter and most other standard suction catheters may be used with the adapter tip. The adapter tip should be firmly seated by pushing it down to within 1/8 inch of the end of intake valve. All catheters should be firmly seated into the adapter tip before use.

Note:

If catheter is equipped with a thumb port, it must be sealed with non-porous tape prior to use.

B. V-VAC STORAGE

The V-VAC has a shelf life of five years when properly stored. The V-VAC is best stored protected from light, in the compressed position, and fully assembled. Storage in this manner protects against degradation of the plastic and maintains cartridge bellow. Care should be taken to protect the soft tip of the intake valve from distortion by securing the protective tip cover during storage.

Storage:

1. V-VAC fully assembled;
2. V-VAC sliding handle in the compressed position;
3. Protect intake valve with tip cover; and
4. Protect from light.

C. PRECAUTIONS

1. Clogging - Intake Valve

The reverse taper of the nozzle and one way valve at the tip reduces the likelihood of a clog. Should a clog occur, it will be located at the tip. The clog may be cleared by- pushing the particle through the valve, pulling the particle out of the valve, or by vigorously squeezing the handle which will suck the particle through the valve and into the cartridge.

2. Clogging - Exhaust Valve

Clogging of the exhaust valve may occur if the cartridge becomes full, or if a partially filled cartridge is held tip up causing fluid to cover the interior opening of the exhaust valve. In either case, continued pumping will cause fluid to be pumped out of the exhaust valve, and the valve may clog. If the exhaust filter clogs while the cartridge is full of liquid-, the handle will not return to its original position. Clogging can be cleared by flipping open the exhaust valve cap which holds the filter. In most cases the exhaust valve will clear and the unit will again operate. Some fluid may escape through the exhaust valve when the exhaust- filter is removed.

Exhaust valve clogging may be prevented with proper handling of the V-VAC. The unit should always be held with the tip down.

IV. CONCLUSION

The V-VAC is a self contained, light-weight, portable suction device which provides efficient and effective suction without an external power source. Proper training and practice manipulation of the suction device will familiarize you with the V-VAC, and allow rapid deployment during life threatening emergencies.