

# PEPP Renewal



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## Section 7: PEPP Renewal

### Overview

The PEPP Renewal Course is the newest addition to the PEPP Program. Each PEPP Course Coordinator can choose from 2 options to renew their student's PEPP Course Completion Card.

The first option incorporates a combination of Online and On-Site components for the individual who wishes to expand his or her knowledge of pediatric care. There are two components to this option: Online Education and On-Site Skills. This renewal option is truly a continuing education course, as it not only reviews previous PEPP material but also introduces new material as a part of the course curriculum.

The second option is a complete Classroom Renewal Course. The Classroom Renewal Course utilizes the new skill stations included in this manual along with original PEPP course lectures, scenarios, and videos. On page 268 you will find the Classroom Renewal Course Schedule.

### ■ Philosophy

#### Online Education

These lessons use cutting-edge technology to create a colorful, dynamic, and interesting learning environment that maximizes retention. The online component was conceived to allow greater access to the PEPP program material.

#### On-Site Skills

The On-Site Skills component of the course is based on interaction, support, and guidance. After the participant successfully completes the Online Education, he or she will contact a local PEPP Course Coordinator to attend an On-Site Skills component. The student is evaluated on his or her performance and provided with ample opportunities to hone pediatric assessment and treatment skills and, if needed, remediation of skills.

#### Classroom Renewal Course

The AAP is committed to providing high quality pediatric continuing education to EMS providers in any region. In order to maximize accessibility to the PEPP Course, we have created a complete Classroom Renewal Course schedule that allows instructors to meet the logistical, financial, and technological needs of their students. However, we encourage the use of the Online Education component in conjunction with the On-Site Skills component where possible.

**SPECIAL NOTE:** Each provider will be evaluated on the entire content of the PEPP Course, not just the content of the PEPP Renewal Course. To be successful, a student must prepare for the PEPP Renewal Course by reviewing the entire *Pediatric Education for Prehospital Professionals* textbook.

### ■ Logistics

#### Online Education

The participant must log onto the PEPP web site at [www.PEPPsite.com](http://www.PEPPsite.com) to take the PEPP Online Education component. Any person may participate in the PEPP Online Education component; however, only those who have a valid PEPP Course Completion Card can renew their PEPP provider status by also successfully completing the On-Site Skills component. After the Online Education component is complete, the participant will be able to print a completion certificate to present to the PEPP Course Coordinator, along with his or her completion card, at the On-Site Skills component. The participant will be directed to find a PEPP Course Coordinator online.

#### On-Site Skills

The On-Site Skills component will consist of small group scenario-based sessions that review pediatric assessment, treatment, and transport skills followed by a written evaluation. In keeping with the PEPP Course Policy, a medical advisor is required for the PEPP Renewal Course and the student to faculty ratio should be 6:1 or less.

#### Classroom Renewal Course

The PEPP Course Coordinator will follow the included schedule for a Classroom Renewal Course. The "skill stations" utilized in this course are the new scenarios created for the PEPP Renewal Course and are included with this manual. In keeping with PEPP Course Policy, a medical advisor is required, and the student to faculty ratio should be 6:1 or less. Students who have passed the Online Education component can enter the Complete Classroom Renewal Course at the point indicated on the schedule.

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### ■ Implementation

#### Online Education

A prospective student can link to the Online Education component from the PEPP web site at [www.PEPPsite.com](http://www.PEPPsite.com). After submitting payment for the course, either via the Internet or by calling 800-832-0034, he or she will be e-mailed an access code to begin the course. The Online Education component can be completed in approximately three hours; however, participants are not required to complete the entire course in one sitting. Because the student's progress is automatically saved, he or she may interrupt the course at any point and later continue where he or she left off.

#### On-Site Skills

Every PEPP Course Coordinator is authorized to hold the On-Site Skills component of the PEPP Renewal Course. A provider who has successfully completed the Online Education component must present the completion certificate along with a PEPP Course Completion Card to the PEPP Course Coordinator at the On-Site Skills component.

Upon completing the On-Site Skills component the PEPP Course Coordinator enters each student into a roster on [www.PEPPsite.com](http://www.PEPPsite.com). New course completion cards are mailed according to existing PEPP program procedures.

A PEPP Renewal Course will count towards the Course Coordinator renewal requirements to teach two courses in two years.

#### Classroom Renewal Course

Every PEPP Course Coordinator is authorized to hold the Classroom Renewal Course.

Upon completing the Classroom Renewal Course, the PEPP Course Coordinator enters each student into a roster on [www.PEPPsite.com](http://www.PEPPsite.com).

A Complete Classroom Renewal Course will count towards the Course Coordinator renewal requirements to teach two courses in two years.

**SPECIAL NOTE:** New course completion cards are mailed according to existing PEPP Program procedures, and the "RENEWAL" check box on the PEPP Course Completion Card will be marked by the PEPP Course Coordinator prior to issuance.

### Policies

### ■ Costs

Option 1 (Online Education with On-Site Skills): Participants will pay \$14.95 to access the online course. For group discounts please call 800-832-0034. On-Site Skills component costs will be determined by each PEPP Course Coordinator.

Option 2 (Classroom Renewal Course): No additional costs are associated with this option. All current PEPP fees as outlined in the administrative section of the PEPP Resource Manual remain in effect. Course cost is determined by the individual PEPP Course Coordinator.

### ■ Participation Requirements

#### Online Education

There are no prerequisites to participate in the Online Education component. However, many states may have requirements in order to receive credit. Please check with your local EMS authority.

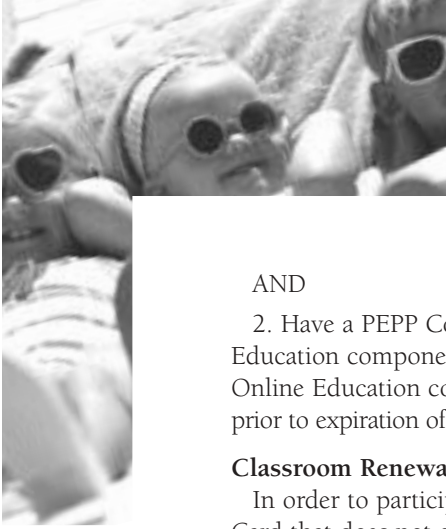
If a desire to obtain a new PEPP Course Completion Card is indicated on the registration form, the student is required to provide the date of issue of the expiring PEPP Course Completion Card so his or her participation in the initial PEPP Course can be verified.

A student may participate in the Online Education component as many times as he or she wishes.

#### On-Site Skills

In order to proceed to the On-Site Skills Component of the PEPP Renewal Course, the student must:

1. Successfully complete the Online Education component and present an online completion certificate.



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AND

2. Have a PEPP Course Completion Card that is valid on the date of the provider's first log-in to the Online Education component. (For example, a provider presents a card that expired on May 15, 2002 and began in the Online Education component on May 10, 2002. Since the provider began the PEPP Online Education component prior to expiration of his or her PEPP Course Completion Card, he or she may participate in the On-Site Skills component.)

### Classroom Renewal Course

In order to participate in the Classroom Renewal Course the participant must have a valid PEPP Course Completion Card that does not expire prior to the completion of the Classroom Renewal Course.

Prospective participants who have completed the Online Education component must meet above participation requirements for On-Site Skills and can either attend the Classroom Renewal Course in total or enter at the designated time on the Classroom Renewal Course schedule.

## Completion (Time limits, Passing grade, etc)

### ■ Time Limits

#### Online Education

The student will have 45 days from the initial login date to complete the Online Education component of the PEPP Renewal Course. There are no minimum or maximum access time limits while logged into the Online Education component, and the student is not required to complete the entire course in one sitting.

#### On-Site Skills

The student must arrange to attend the On-Site Skills component of the PEPP Renewal Course within 90 days of issuance of the Online Education completion certificate.

#### Classroom Renewal Course

This schedule is designed for same day completion; however, at the discretion of the PEPP Course Coordinator, it may be modularized for presentation over two or more sessions.

Prospective students who have completed the Online Education component must attend the Classroom Renewal Course within 90 days of issuance of the Online Education completion certificate.

### ■ Evaluation

#### Online Education

To receive a completion certificate, the student must achieve a minimum grade of 80% on the final Online Education test.

#### On-Site Skills

Upon completion of the scenario-based skills, the PEPP Course Coordinator must administer the initial PEPP post-test. Providers must receive a minimum grade of 80% on the PEPP post-test.

#### Classroom Renewal Course

Upon completion of the Classroom Renewal Course, the PEPP Course Coordinator must administer the initial PEPP post-test. Providers must receive a minimum grade of 80% on the PEPP post-test.

### ■ Continuing Education (CE) Credits

#### Online Education

The AAP has contacted each state's EMS authority and has recommended a minimum of three CE hours be granted for the Online Education component. Because the amount of approved CE hours may vary from state to state, please contact your local or state EMS authority for more information.

#### On-Site Skills

The AAP cannot grant CE hours for the On-Site Skills component. The PEPP Course Coordinator should follow their state or local policies when applying for CE hours for this course.

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### Classroom Renewal Course

The AAP cannot grant CE hours for the Classroom Renewal Course. The PEPP Course Coordinator should follow their state or local policies when applying for CE hours for this course.

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### ■ Rosters

#### Submitting a Renewal Roster

A PEPP Renewal Course roster is submitted the same way as the initial course roster. While filling out the roster information, you should indicate that the course is a renewal by checking the box labeled “renewal course.” The AAP will process rosters and send cards according to the standard procedure for card issuance.

#### Issuance of Cards

PEPP Renewal Course Completion Cards are exactly the same as the initial PEPP Course Completion Card, and they are issued according to the same standards as the initial course. If a Classroom Renewal Course was completed, the PEPP Course Coordinator will indicate this on the PEPP Course Completion Card by checking the box next to the word “RENEWAL.” Rosters are processed and mailed on a weekly basis.

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### ■ Ongoing Improvements/Modifications

#### Online Education

The interactivities and question/answer sessions will be tracked by software. These reports will be used to identify potential errors and allow for continuous quality improvement.

#### On-Site Skills

PEPP Course Coordinators are required to have students fill out course evaluation sheets for the first PEPP Renewal Course they complete. These first-time evaluations must be submitted to the AAP. Submission of subsequent evaluations is encouraged, but is not a requirement.

#### Classroom Renewal Course

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### Complete Classroom PEPP Renewal Course Schedule

Introduction and Schedule Overview		5 minutes	
Lecture	Child Development—Applying the Pediatric Assessment Triangle	45 Minutes	
Lecture	Choose 1: Toxic Exposures Making a Difference	30 Minutes	
	Break	10 Minutes	
Scenarios	Cardiovascular	45 Minutes	
	Medical Emergencies	45 Minutes	
	Break	10 Minutes	
Scenario	Emergency Delivery and Newborn Stabilization	30 Minutes	
Video	Airway Skills	30 Minutes	<b>Note:</b> This is the point where Online Students enter to complete the Renewal Course.
Skill Station 1	Foreign Body Airway Obstruction and Tracheostomy Management	40 Minutes	
	Break	10 Minutes	
Skill Station 2	Seizure	40 Minutes	
Video	Intravenous/Intraosseous access and Spinal Immobilization	15 Minutes	
Skill Station 3	Trauma	40 Minutes	
Post test		25 Minutes	
<b>Total Time: Excluding Breaks</b>		<b>7.00 hours 6.50 hours</b>	

Approved for release 8/30/02



## Foreign Body Airway Obstruction

### Overview

This is a patient management station involving a child with a foreign body airway obstruction. During the scenario, the BLS student is expected to perform foreign body airway maneuvers, provide supplemental oxygen, and provide bag-valve-mask (BVM) ventilation. The ALS student will provide adequate BLS skills followed by foreign body removal with Magill forceps.

### Equipment

- Gloves, goggles, or protective eyewear
- Child manikin
- Towel roll
- Suction catheters of different sizes
- Oxygen masks (various types and sizes)
- BVM device (child and adult) including masks (several sizes)
- Stethoscope

ALS students will also need:

- Oxygen saturation monitor/pulse oximetry probe
- Cardiac monitor
- Laryngoscope
- Laryngoscope blades of various sizes
- Magill forceps

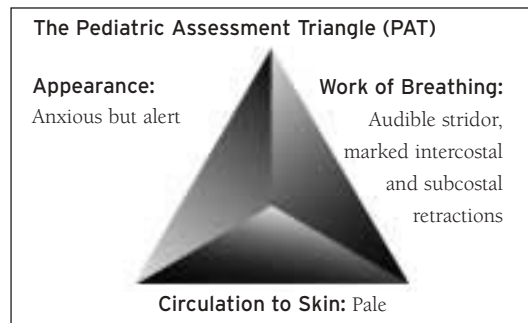
### Case Presentation

You are dispatched to an 18-month-old boy with difficulty breathing. Upon your arrival, you are met at the door by an anxious mother holding a toddler with obvious respiratory distress.

### Faculty Information:

#### Initial Assessment

Pediatric Assessment Triangle (PAT)



#### ABCDE's

*Airway:* Stridor audible, drooling clear secretions.

*Breathing:* Respiratory rate 32 breaths/min, minimal chest rise, intercostal and suprasternal retractions, lung sounds are decreased bilaterally, pulse oximetry 93% on room air.

*Circulation:* Heart rate 154 beats/min, pulse quality is strong and regular.

*Disability:* AVPU=V (verbal).

*Exposure:* No additional information. Weight is 13 kg.



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### Focused History

*Signs and symptoms:* Was sitting in his highchair eating chopped pears with his fingers when he began to cough and have trouble breathing.

*Allergies:* Amoxicillin.

*Medications:* None.

*Past medical history:* Occasional ear infection, otherwise healthy.

*Last meal:* Eating dinner when this began.

*Events of incident:* Mom got him out of the highchair and called 9-1-1 when she realized he was choking.

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### ■ Case Development

It has been 8 minutes since the 9-1-1 call, and the child appears to be not alert; he is increasingly sleepy and is not crying or verbalizing.

(Ask the students to outline their management priorities.)

- **BLS Management:**
    - ▶ Position the head.
    - ▶ Open the airway.
    - ▶ Observe for obvious foreign body in the mouth.
  - **ALS Management:**
    - ▶ Place patient on pulse oximeter.
    - ▶ Place patient on cardiac monitor.
- 

### ■ Case Development

Respiratory rate has fallen to 20 breaths/min with no chest rise. The pulse oximeter is reading 80%.

(Ask the students to outline their management priorities.)

- **BLS Management:**
    - ▶ Perform 5 abdominal thrusts.
    - ▶ Reassess airway patency and attempt to provide BVM ventilation.
- 

### ■ Case Development

The child's airway remains completely obstructed despite basic foreign body airway maneuvers.

(Ask the students to outline their management priorities.)

- **BLS Management:**
    - ▶ Continue cycles of 5 abdominal thrusts followed by observing mouth for foreign body.
    - ▶ Remove foreign body if visualized.
    - ▶ Continue attempts at BVM ventilation.
  - **ALS Management:**
    - ▶ Perform direct laryngoscopy using Magill forceps to remove foreign body obstructing the airway.
    - ▶ After removal of the foreign body, ventilate with BVM using 100% oxygen.
- 

### ■ Case Conclusion

After BVM ventilation, the oxygen saturation increases to 89%. After ALS intervention and ventilations with the BVM, the heart rate is 120 beats/min and the pulse oximeter reading is 97%. During transport, you continue to assist ventilation with a BVM device. After approximately 5 minutes, the child's respiratory rate is 28 breaths/min with good chest rise. Supplemental oxygen is administered en route.

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### ■ Case Discussion Points

(Review and remediate any skills that were not completed with the group. If there is additional time, review the following discussion points.)

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1. Why did this child have stridor?
  - Stridor was present due to the airflow across the partially obstructed upper airway structures. The narrow diameter of the pediatric airway places a young child at high risk for airway obstruction.
2. If BLS maneuvers do not relieve a complete airway obstruction, what can BLS providers do?
  - BLS providers should be prepared to perform 5 abdominal thrusts followed by attempts to ventilate the child with a BVM device. This sequence should be continued until the obstruction is removed or ALS providers arrive. Early transport should be initiated with care continued en route.
3. If there is a complete airway obstruction, why attempt ventilation?
  - Even in the setting of significant upper airway obstruction, some air may be forced past the foreign body with assisted ventilation. While carbon dioxide retention will be well tolerated, prolonged hypoxia will lead rapidly to irreversible brain injury. Every effort should be made to provide oxygenation.

### Summary of exercise:

BLS Skills	ALS Skills	Discussion Points
Position the head Perform basic foreign body airway maneuvers	BLS skills Cardiac monitor Pulse oximeter Direct laryngoscopy Magill forceps	When to perform BLS foreign body maneuvers Always begin with BLS airway maneuvers When to use direct laryngoscopy
Supplemental oxygen		Flow rate and delivery methods
BVM ventilation	BVM ventilation	BVM ventilation with a complete airway obstruction



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### Seizure

#### ■ Overview

This is a patient management station involving a seizure. During the scenario, the BLS student is expected to position the airway, suction, provide supplemental oxygen, use a length-based tape, insert a nasopharyngeal airway, and provide bag-valve-mask (BVM) ventilation. The ALS student will perform appropriate BLS skills followed by providing medication (IV, IM, PR or IO), and discuss use of nasogastric/orogastric intubation.

#### ■ Equipment

- Gloves, goggles, or protective eyewear
- Child manikin
- Towel roll
- Rigid tonsil-tip suction catheter
- Oxygen masks (various types and sizes)
- Pediatric-length-based resuscitation tape
- BVM device (child and adult) including masks (several sizes)
- Oxygen masks (several sizes)
- NP and OP airways (various sizes)
- Tongue blade
- Stethoscope

#### ALS students will also need:

- Oxygen saturation monitor/pulse oximetry probe
- Cardiac monitor
- Intravenous cannulae (various sizes)
- IO needle
- Syringes (2 each of 1, 3, 5 and 10 ml)
- Normal saline
- Double lumen sump tube (various sizes)
- Simulated medication for administration (diazepam, midazolam)

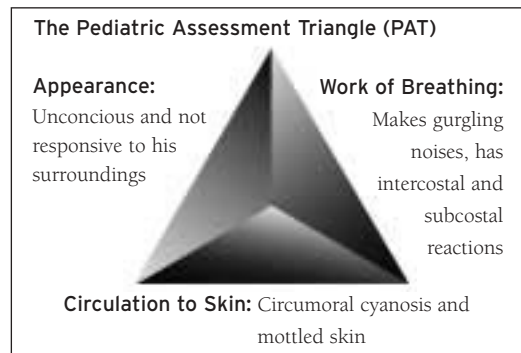
#### ■ Case Presentation

You are called to the home of a 3-year-old boy having a seizure. Upon your arrival, you find a child in bed with rhythmic jerking of both of his arms and legs. He is unresponsive.

#### ■ Faculty Information

##### Initial Assessment

Pediatric Assessment Triangle (PAT)



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### ABCDE's

*Airway:* Gurgling noises with pooled saliva and drooling.

*Breathing:* Respiratory rate 30 breaths/min, irregular; gurgling noises obscure lung sounds.

*Circulation:* Heart rate 148 beats/min; unable to obtain blood pressure due to motor activity; pulse oximeter not tracking due to patient movement.

*Disability:* AVPU=U (unresponsive).

*Exposure:* No obvious deformities, rashes, or bruising. Weight is 15 kg.

### ■ Focused History

*Signs and symptoms:* For over the last 24 hours, he has had a fever, vomiting, and has been unable to take his medicine. There is no history of trauma.

*Allergies:* No known allergies.

*Medications:* Carbamazepine (Tegretol®).

*Past medical history:* The child has a seizure disorder.

*Last meal:* Last intake was yesterday evening.

*Events of incident:* This is a typical break-through seizure for this child. Past seizures have lasted hours. His mother gave him an acetaminophen suppository 1 hour ago as well.

### ■ Case Development

It has been 10 minutes since the 9-1-1 call and the seizure is ongoing.  
(Ask the students to outline their management priorities.)

- BLS Management:
  - ▶ Position the head.
  - ▶ Open the airway.
  - ▶ Suction the oropharynx.
  - ▶ Provide supplemental oxygen with a partial nonrebreathing mask (oxygen set at 10-12 L/min.).
- ALS Management:
  - ▶ Place patient on pulse oximeter.
  - ▶ Place patient on cardiac monitor.

### ■ Case Development

The noisy breathing and gurgling is improved with suction. The child continues to seize (12 minutes since the call). He becomes increasingly cyanotic, despite the oxygen, and his heart rate is now 90 beats/min.

(Ask the students to outline their management priorities.)

- BLS Management:
  - ▶ Suction the airway.
  - ▶ Determine correct size and insert the NP airway.
  - ▶ Begin BVM ventilation.
- ALS Management:
  - ▶ Use pediatric length-based resuscitation tape to determine the appropriate dose of anticonvulsant medication.
  - ▶ Options include:
    - ▶ Diazepam IV dose: 0.1-0.2 mg/kg
    - ▶ Diazepam rectal dose: 0.5 mg/kg (Max 10 mg)
    - ▶ Midazolam IM dose: 0.1 mg/kg
  - ▶ Establish IV access, if this route of administration is chosen.

### ■ Case Development

BVM ventilation results in good chest rise, pulse oximetry reading of 98% and pink color. The seizure stops after one dose of anticonvulsant medication. Shortly after the seizure stops, the child's respiratory



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rate falls to 12 breaths/min with decreased chest rise. You note poor air entry on auscultation and that his skin color is pale. His heart rate is 110 beats/min and his oxygen saturation is 90%. (Ask the students to outline their management priorities.)

- BLS and ALS Management:
  - ▶ Suction the airway.
  - ▶ Continue BVM ventilation.

### ■ Case Conclusion

During transport you note some abdominal distension and place a NG or OG tube to decompress the stomach. After approximately 5 minutes, the patient begins to wake up and fights your BVM ventilation. You stop assisted ventilation and provide supplemental oxygen by a partial nonrebreathing mask en route.

### ■ Case Discussion Points

(Review and remediate any skills that were not completed with the group. If there is additional time, review the following discussion points.)

1. Why does this child have gurgling noises and circumoral cyanosis?
  - When a child has a seizure, loss of oropharyngeal muscle tone can lead to airway obstruction as the tongue falls backward. This is treated with airway positioning and airway opening maneuvers (head-tilt/chin-lift or jaw thrust). In addition, the child may not be adequately swallowing his secretions and may require suctioning.
2. Why should nasal cannula oxygen not be used in this case?
  - Although a nasal cannula does provide supplemental oxygen flow, use of this device is limited to a maximum of 4 L/min. Since the child has circumoral cyanosis, he requires high-flow oxygen via a partial rebreathing mask or a simple face mask.
3. What is the indication for insertion of an oropharyngeal or nasopharyngeal airway?
  - Although airway positioning can be maintained manually throughout the call and transport, it is often easier to insert an airway adjunct to ensure that the airway remains open. Placement of an oropharyngeal airway may be difficult due to jaw rigidity. In addition, most seizing children have an intact gag reflex and will be at high risk for vomiting and aspiration with an oropharyngeal airway placement. A nasopharyngeal airway will be easier to insert and better tolerated than an oropharyngeal airway in a seizing child.
4. What is the benefit of using perirectal (PR) medication over intravenous/intraosseous (IV/IO) or intramuscular (IM) administration in this scenario?
  - The risk of respiratory depression is less when diazepam is given rectally, rather than IV, making this a safer route. Ease of administration is another benefit. The delay involved in establishing an IV line may offset the advantage of immediate absorption via the IV route. The choice of IM midazolam offers similar advantages in terms of ease of administration. However, diazepam cannot be administered via the IM route due to poor absorption and local tissue irritation. Except in extraordinary circumstances, placement of an IO line should be reserved for children in status epilepticus who have failed PR diazepam therapy, and in whom an IV cannot be rapidly placed.
5. Why does this child deteriorate after the seizure stops?
  - Respiratory depression is a common side effect of benzodiazepine administration. It is essential that the child's respiratory rate and effort, color, heart rate, and oxygen saturation be monitored carefully when anticonvulsant medications have been given.
6. Why is intubation not indicated at this point?
  - Respiratory depression as a consequence of medication administration tends to resolve relatively quickly as the drug is metabolized. Providing assisted ventilation for a few minutes is often all that is required, making the risk of intubation potentially outweigh its benefits. Remember that by providing adequate ventilation with 100% oxygen you will blunt the child's own respiratory drive. You may have to withhold ventilation for 30-60 seconds, while monitoring oxygen saturation, to allow time for carbon dioxide to build up and trigger the brainstem respiratory drive.

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7. Why should NG/OG tube insertion be considered for long transport times?

- Prolonged BVM ventilation can result in gastric (stomach) distention. The upward pressure of the distended stomach on the diaphragm makes it hard to deliver positive pressure breaths, necessitating higher inspiratory pressures and increasing the risk of barotraumas (pneumothorax, pneumomediastinum). In addition, gastric distention increases the likelihood of vomiting and aspiration. Insertion of an NG/OG tube can help decompress the stomach and make assisted ventilation easier.

### Summary of exercise

BLS Skills	ALS Skills	Discussion Points
Position head Open airway Suction	BLS skills Cardiac monitor Oxygen saturation monitor (Pulse oximeter)	Always start with BLS airway maneuvers
Supplemental oxygen Length-based tape Airway adjuncts	Length-based tape Medication delivery	10-12 L/min OP/NP airway indications Medication routes/ doses vary
BVM ventilation	BVM ventilation	Respiratory depression after benzodiazepine use
	NG/OG tube insertion	



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### Special Health Care Needs: Tracheostomy Obstruction

#### ■ Overview

This is a patient management station involving a child with a tracheostomy. During the scenario, the BLS student is expected to instill saline and suction the tracheostomy, provide supplemental oxygen, use a length-based tape, and provide ventilation through the tracheostomy tube using a bag-valve-mask (BVM) device. The ALS student will provide adequate BLS skills followed by replacement of the tracheostomy tube.

#### ■ Equipment

- Gloves, goggles, or protective eyewear
- Manikin (prefer child or junior)
- Towel roll
- Suction catheters of different sizes
- Oxygen masks (various types and sizes including tracheostomy mask)
- BVM device (child and adult) including masks (several sizes)
- Stethoscope

#### ALS students will also need:

- Pulse oximetry device
- Cardiac monitor
- Replacement tracheostomy tube with tape
- Endotracheal tubes 3.0-8.0 mm

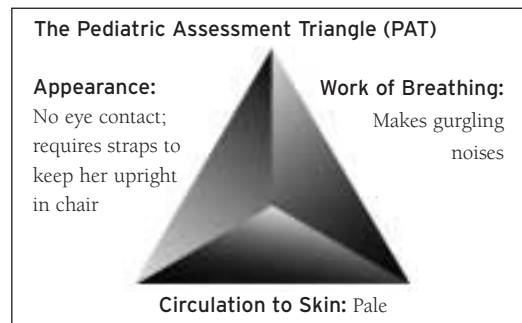
#### ■ Case Presentation

You are called to a rehabilitation center for a 16-year-old girl with respiratory distress. Upon your arrival, you find a child sitting in a wheelchair, who is experiencing difficulty breathing through her tracheostomy. Her eyes are open, but she does not look at you.

#### ■ Faculty Information

##### Initial Assessment

Pediatric Assessment Triangle (PAT)



##### ABCDE's

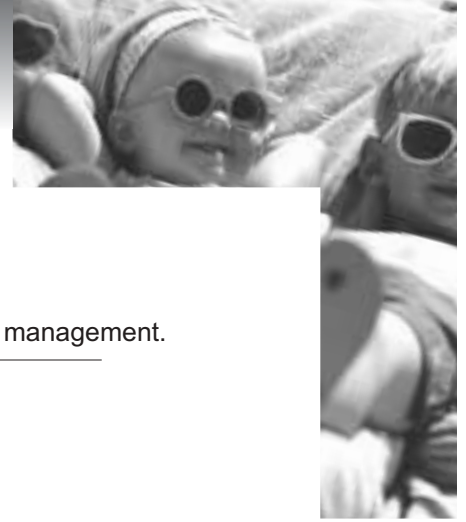
*Airway:* Gurgling noises with mucus coming from the end of the tracheostomy tube.

*Breathing:* Respiratory rate 44 breaths/min, but with little chest rise, intercostal and suprasternal retractions, lung sounds are diminished, pulse oximetry 85%.

*Circulation:* Heart rate 136 beats/min, blood pressure 110/70 mm Hg, breathing on room air, pulse is strong and regular.

*Disability:* Eyes are open but non-interactive; AVPU=A (alert).

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*Exposure:* Reveals bruising on both arms from recent IV sites. Weight is 55 kg.

**Focused history and detailed physical examination deferred as patient needs immediate management.**

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### ■ Case Development

It has been 12 minutes since the 9-1-1 call, the patient is no longer alert, and is cyanotic. (Ask the students to outline their management priorities.)

- BLS and ALS Management:
    - ▶ Remove patient from the wheelchair to the floor or bed.
    - ▶ Position the head and open the airway.
    - ▶ Suction the tracheostomy tube.
    - ▶ Attempt to ventilate with a BVM device and 100% oxygen.
- 

### ■ Case Development

There is poor chest rise and it is difficult to force air through the bag. (Ask the students to outline their management priorities.)

- BLS Management:
    - ▶ Instill 2-3 ml of saline into the tracheostomy tube and resuction.
  - ALS Management:
    - ▶ Place patient on pulse oximeter (pulse oximeter reads 80% on 100% O<sub>2</sub>) and cardiac monitor (heart rate 80 beats/min).
    - ▶ Instill 2-3 ml of saline into the tracheostomy tube and resuction.
- 

### ■ Case Development

The child's tracheostomy tube remains obstructed and the child's color is cyanotic. (Ask the students to outline their management priorities.)

- BLS Management:
    - ▶ Remove the tracheostomy tube.
    - ▶ Begin BVM ventilation over the mouth while your partner holds gauze over the stoma; if the chest does not rise, place a neonatal mask over the stoma and attempt BVM ventilation over the stoma.
  - ALS Management:
    - ▶ Remove tracheostomy tube.
    - ▶ Replace with tracheostomy tube provided by the rehabilitation center or determine ET tube size using the length-based resuscitation tape and replace the tracheostomy tube with a 6.0 mm ET tube inserted into the stoma about half the distance used if it were inserted through the mouth.
    - ▶ Attach BVM device and ventilate.
- 

### ■ Case Development

After replacing the tracheostomy tube and beginning ventilations with the BVM device, the heart rate is 90 beats/min, and the pulse oximeter reading is 96%.

(Suggest to students that a focused history be obtained as the patient has been stabilized.)

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### ■ Focused History

- *Signs and symptoms:* During physical therapy this morning, the patient began experiencing difficulty breathing through her tracheostomy tube.
- *Allergies:* No known allergies.
- *Medications:* Paroxetine hydrochloride (Paxil™ an antidepressant) and Tylenol™.
- *Past medical history:* The child was hospitalized for four weeks following a drug overdose. She had a tracheostomy placed 6 weeks ago. She was released from the hospital last week and sent to the rehabilitation center for physical therapy. She suffered anoxic brain injury after the overdose.



## Section 7: PEPP Renewal

- *Last meal:* Last solid intake was breakfast 3 hours ago.
- *Events of incident:* Therapists noted increased coughing and tracheostomy tube secretions this morning. She developed a sudden onset of respiratory distress that precipitated the 9-1-1 call. Attempts by staff to suction the tracheostomy were unsuccessful in relieving her distress.

### ■ Case Conclusion

During transport, you continue to ventilate the patient. After approximately 10 minutes, the patient begins to fight your ventilation, so you provide supplemental oxygen en route using an oxygen mask over the stoma.

### ■ Case Discussion Points

(Review and remediate any skills that were not completed with the group. If there is additional time, review the following discussion points.)

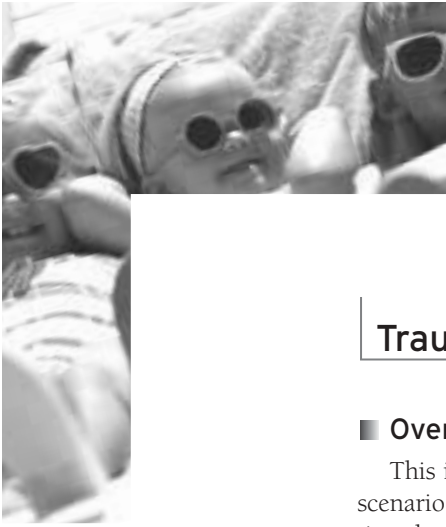
1. Why is this child experiencing an airway obstruction?
  - When a tracheostomy tube is placed because of obstruction of the upper airway, the trachea may be exposed to environmental irritants. The body produces mucus to coat the airway against the irritants. This mucus can become dried with the constant airflow through the tracheostomy tube. Hardened mucous can build up inside the lumen of the tracheostomy tube, leading to obstruction of airflow in the tube. This can become a complete airway obstruction if not managed correctly.
2. How should you manage thick secretions from a tracheostomy tube?
  - Instill 2-3 ml of saline in the tube opening.
  - Allow it to penetrate the secretions and suction the tracheostomy tube. Suction for no more than 10 seconds at a time to avoid hypoxemia.
  - Repeat the suctioning with saline flush.
3. Once the obstruction is relieved and the child is breathing again, how should supplemental oxygen be delivered?
  - A tracheostomy mask is the preferred device for delivering supplemental oxygen. If one is not available, place a pediatric partial-rebreathing mask over the tracheostomy tube opening; initially set the oxygen flow rate at 10-12 L/min.
4. If BLS maneuvers cannot clear the tracheostomy tube, what can BLS providers do?
  - Be ready to ventilate the child in the event that the tracheostomy tube cannot be cleared.
  - In most patients, the airway remains open above the tracheostomy. Begin BVM ventilation using a face mask over the nose and mouth. A second EMT places a gloved finger with gauze over the tracheostomy tube if the air begins to leak from the tracheostomy opening.
  - Parents are often panicked when they call for 9-1-1, however most have received training in the replacement of a tracheostomy tube. With your assistance, they can try to replace the tube.
5. What are the indications for replacing a tracheostomy tube?
  - If the child's airway remains obstructed after BLS maneuvers, then remove and replace the tracheostomy tube.
6. What if I can't get the tube into place?
  - Replace the tracheostomy tube with a tube of the same size.
    - ▶ If you cannot get the tube into place, place a tube one size smaller.
    - ▶ If the tube does not slide into the opening, place a finger on either side of the opening, and gently apply traction to pull the skin taut. This allows easier access to the stoma.
    - ▶ If you still have trouble, take a small suction catheter and slide it into the tracheostomy tube. The 15-mm hub should rest against the suction port. Place the end of the catheter into the stoma and slide the trach tube down over the catheter into the opening. If another tube is not available, an ET tube of the same outer diameter can be used.

## Section 7: PEPP Renewal



### Summary of exercise:

BLS Skills	ALS Skills	Discussion Points
Position head Suction (+/-) Pulse oximeter	BLS skills Cardiac monitor Pulse oximeter	Always start with BLS airway maneuvers.
Supplemental oxygen		10-12 L/min
BVM ventilation	BVM ventilation	BVM device on a tracheostomy tube
	Replace tracheostomy tube	Rationale for replacing tracheostomy tubes



## Section 7: PEPP Renewal

### Trauma

#### ■ Overview

This is a patient management station involving a child who sustained trauma after a fall. During the scenario, the BLS student will be expected to open the airway with a modified jaw-thrust maneuver, suction the airway, provide supplemental oxygen, use a pediatric length-based resuscitation tape, provide bag-valve-mask (BVM) ventilation, and apply spinal immobilization. The ALS student will be expected to perform appropriate BLS skills followed by intubation of the patient, confirmation of the endotracheal tube (ET) placement, and establishment of intravenous/intraosseous (IV/IO) access.

#### ■ Equipment

- Gloves, goggles, or protective eyewear
- Manikin (prefer junior manikin)
- Suction catheters of different sizes
- Oxygen masks (various types and sizes)
- BVM device (child and adult) including masks (several sizes)
- Stethoscope
- Cervical collars (various sizes)
- Long board or child immobilization device

#### ALS students will also need:

- Oxygen saturation monitor/pulse oximetry probe
- Cardiac monitor
- Intubation equipment
- Laryngoscope
- Laryngoscope blades of various sizes
- Magill forceps
- Endotracheal tubes of various sizes (3.0-8.0 mm)
- CO<sub>2</sub> detector device or esophageal detector bulb to confirm ET placement
- Tape to secure tube or ET tube holder device
- IV catheters of various sizes
- IO needle
- Normal saline and tubing

#### ■ Case Presentation

You are called to the side of a river for a 9-year-old boy who fell off a rope swing into the water. His friends say that they were swinging out and jumping into the water, but the child got caught on the rope and swung back toward the shore before falling off. They report the child went into the water headfirst and did not come back up on his own. The children flagged down a passing police officer who pulled the child from the water and has been doing mouth-to-mask ventilation. Upon your arrival, you find the child receiving ventilation from the officer. The child is not moving and is pale.

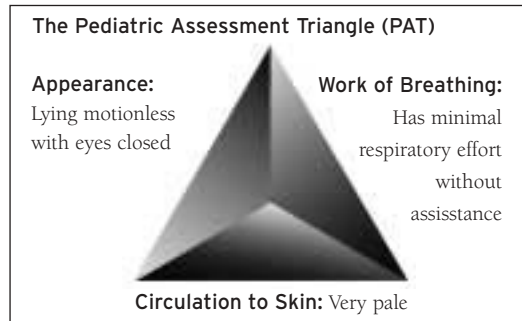
## Section 7: PEPP Renewal



### ■ Faculty Information

#### Initial Assessment

Pediatric Assessment Triangle (PAT)



*Appearance:* Lying motionless with eyes closed

*Work of Breathing:* Has minimal respiratory effort without assistance

*Circulation to the Skin:* Very pale

#### ABCDE's

*Airway:* Gurgling noises with assisted ventilations.

*Breathing:* Respiratory rate 6 breaths/min, but with little chest rise; lung sounds are diminished; pulse oximetry does not correlate with the pulse.

*Circulation:* Heart rate 148 beats/min; brachial pulse weak; blood pressure 70/40 mm Hg.

*Disability:* AVPU= P (pain); patient responds with a moan if you pinch his ear, but remains flaccid.

*Exposure:* Bruising and minor bleeding from the occiput. Weight is 45 kg from pediatric length-based resuscitation tape.

**Focused history deferred**

### ■ Case Development

It has been 4 minutes since the police car was flagged down and radioed in for medical assistance. The patient has been receiving mouth-to-mask ventilation from the police officer.

(Ask the students to outline their management priorities.)

- BLS and ALS Management:
  - ▶ Immobilize the spine.
  - ▶ Size and place a cervical collar on the patient and move him to a longboard or other suitable device.
  - ▶ Open the patient's airway using a modified jaw-thrust maneuver.
  - ▶ Suction the airway.
  - ▶ Begin BVM ventilation (with 100% oxygen) using a two-person technique.

### ■ Case Development

After beginning ventilation with the BVM, the heart rate continues to be 148 beats/min and the pulse oximeter is not consistently picking up a signal. The child makes no effort to open his eyes or interact and his skin is pale. The child's airway remains noisy despite several attempts to suction and maintain the positioning.

(Ask the students to outline their management priorities.)

- BLS Management:
  - ▶ Continue BVM ventilation.
  - ▶ Suction the airway again.
  - ▶ Insert an oropharyngeal airway.
- ALS Management:
  - ▶ Intubate with an appropriate size ET tube (6.0 mm).



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- ▶ Confirm placement with capnometry or bulb aspiration device.
- ▶ Secure the ET tube.
- ▶ Begin transport of patient.

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### ■ Case Development

During transport, you continue to provide BVM ventilation and the heart rate drops to 120-130 beats/min and blood pressure 85/45 mm Hg. You cannot start an IV.

- BLS Management:
  - ▶ Continue airway management.
- ALS Management:
  - ▶ Insert an IO line in the child's proximal tibia.
  - ▶ Administer 20 ml/kg of normal saline or lactated Ringer's (45kg x 20 ml/kg = 900 ml).

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### ■ Case Conclusion

During transport, you continue to ventilate the patient and ALS providers instill 450 ml of saline prior to arrival at the emergency department.

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### ■ Case Discussion Points

(Review and remediate any skills that were not completed with the group. If there is additional time, review the following discussion points.)

1. Should this child be hyperventilated?
  - No. Start ventilations with normal ventilatory rates and volumes. Ventilate infants at 30 breaths per minute and children at 20 breaths per minute. If signs of increased intracranial pressure are present after ventilating the child with these rates then increase ventilatory rate by 5 breaths per minute (35 breaths per minute for infants and 25 breaths per minute for children) and observe for change in status (dilated pupil constricts to light or patient not posturing).
2. If a properly sized rigid cervical collar cannot be found, what are the alternatives for cervical immobilization?
  - If a rigid cervical collar is not available, other devices are not recommended. Cervical collars provide resistance to flexion and extension by bracing the chin to the chest. To place any soft material into this area on a child risks causing airway compromise.
  - Place the child onto a longboard and pad any voids.
  - Tape the child's head into place using blocks to minimize lateral movement.
3. Can you place an IO in a 9-year-old trauma patient?
  - Yes. An IV line is preferred as higher flow rates can be achieved, but an IO line can be used if attempts at IV placement are not successful.
  - A contraindication to IO placement is a fracture to the leg with the insertion site. If there is deformity of one leg, use the other leg.
  - Attempt IO placement en route unless transport is not immediately available. The IO needle will allow delivery of crystalloid in the field, and blood products in the emergency department. It is the easiest form of access in many children who are in shock and have no obvious peripheral veins to cannulate.
4. What other injuries may be present?
  - In addition to respiratory failure from water submersion, the patient may have head, spinal, or abdominal injuries. Solid organ injuries after falls and blunt trauma are common in children and may cause compensated or decompensated shock. This child is initially in decompensated shock with hypotension. While the perfusion does immediately improve (heart rate decreases and blood pressure increases) with adequate oxygenation and ventilation, shock continues, and blood loss remains an important concern, requiring fluid administration en route.

## Section 7: PEPP Renewal



BLS Skills	ALS Skills	Discussion Points
Position head (jaw-thrust maneuver) Suction Insert OP airway  (+/-) Pulse oximeter	BLS skills Cardiac monitor Pulse oximeter	Always start with BLS airway maneuvers Putting the child's cervical spine in a neutral position requires careful assessment and positioning of padding with different ages, because of changing head sizes Review OP versus NP airway. Limitations of pulse oximetry
BVM ventilation Two-person technique		Hand positioning for BVM ventilation with two-person technique Review ventilation rate in children of various ages Appropriate hyperventilation
Cervical spine immobilization		Cervical collar sizing, padding for younger children
	Endotracheal intubation Confirmation of placement	Rationale for intubation, formula for correct tube sizing Review techniques for confirmation of placement
	IO Placement	Insertion sites Infusion rates Complications