BEST PRACTICES IN HEALTHCARE

Case Study: Pediatric Airway Management Epiglottitis

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Epiglottitis is defined as an acute inflammation of the epiglottis. This inflammation and swelling are caused by a bacterial infection, usually by Haemophilus influenzae type b (Butterworth et al., 2018). Symptoms associated with epiglottitis include severe sore throat, difficulty and pain when swallowing, difficulty breathing, abnormal or high-pitched breathing noises, hoarse or muffled voice, fever of 100.4 F or higher, irritability and restlessness, and drooling (Butterworth et al., 2018). Although epiglottitis is not common today due to childhood vaccinations, when it does occur it is treated as a medical emergency. Any injury, damage, or swelling of the epiglottis could have fatal consequences due to the potential obstruction of the patient's airway. Thus prompt, exacting, and careful airway management by the anesthesia care team during an acute epiglottitis case is important. Herein, we will highlight the role of the anesthesia technologist with in the anesthesia care team.

Keywords: epiglottitis, difficult airway management, anesthesia technologist

Introduction and History

In our anesthesia technology program, we are taught to participate as vital members of the anesthesia care team. We are taught to participate, think, and contribute when presented with various real and improvised case scenarios. The goal is to generate quality discussions, while also employing best practices and enhance patient safety, and care.

We will consider a fictitious case where we are presented with a 12-year-old boy who has developed an acute sore throat and fever over the course of a day. By evening,

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his temperature has reached 40°C (104°F), and he has developed a low-pitched inspiratory stridor. On arrival at the emergency department (ED), he is quiet, flushed, and seems frightened. Our patient also prefers to be in a sitting position. He is not speaking and is not actively drooling. Radiographs were not attempted as it would delay treatment. From the outset, the emergency physician suspects an airway problem. She thinks it could be epiglottitis. The child is immediately scheduled to be transferred to the operating room (OR). Certainly, the anesthesia care team is made aware and appropriate preparation is necessary. Also, necessary staff like an ENT surgeon that must be present prior to case start.

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During examination in the ED, the child's mother elaborates the patient's history. Our young male patient is otherwise healthy. He is current on his vaccinations and there have been no serious health concerns noted in his health records. This is his first time visiting the ED with a significant medical problem. The child's mother administered Tylenol 250mg twice before arrival to the ED. The mother also provided cold compresses and tried to get the child to rest. The mother reports that the fever increased despite the antipyretics and active cooling. The child has refused to drink or eat for the past 12 hours, citing his sore throat. She did not note any active coughing. She states the child became lethargic, did not want to lie down, but rather wanted to sit up. She observed her child and noticed that he had difficulty breathing, "redness" in the face, did not want to speak, and was making sounds when trying to take a breath. At that point, she decided to bring him to the ED. Currently, our patient seems somewhat agitated. The anesthesia care provider has asked the mother to accompany the child into the OR. She will accompany the child until the start of induction. Our patient is 5' tall and weighs 80 pounds. The goal for the anesthesia care team (ACT) is to ensure safe airway management.

Proper Equipment

Let us consider preparatory steps prior to the patient's arrival to the OR. Indeed, one of the responsibilities of an anesthesia technologist is to ensure that proper equipment is present, and fully functional. The FDA mandates that any anesthesia workstation be fully checked out prior to patient use. These checks are usually completed by the anesthesia technologist before case starts in the morning. Part of the FDA checkout procedure demands the checking of emergency supply of medical gases, functional suction, and an alternative ventilation device such as an appropriately sized pediatric bag-valve-mask. Since our patient weighs only 80 pounds, it is best practice to utilize a pediatric circuit anesthesia circuit. It is best practice to use the appropriate ventilator and tubing as to "provide highly predictable volume ventilation" to children (Ehrenwerth, p. 366). A thorough leak test must be performed, and a recalibration of the flow sensor conducted prior to ventilation of a patient, in order to deliver the most accurate tidal volumes and ventilatory pressures (APSF).

Communication with the ACT and our anesthesia care provider is of utmost importance. Since our patient is 12 years old and epiglottitis is suspected, the correct sizing of the endotracheal tube (ETT) is essential. There are different ways to calculate the size of the tube for this pediatric case. One way, according to Eipe et al. (2009), is to use the typical age-related sizing formula where the sizes are calculated using the formula of age/4 + 3.5 for cuffed ETT. However, another formula for ETT sizing related to body weight can be used, "ID = weight (kg)/10 + 3.5 mm" (Eipe et al. 2009). Using these formulas, the suggested endotracheal tubes ETT in this case would be 6.5 and 7.0. However, since our patient has epiglottitis, sizing down the endotracheal tube will better accommodate the airway edema we expect. As anesthesia technologist should supply a six (6) and six-and-a-half size (6.5) internal diameter ETT, along with a stylet. Since we are using cuffed ETT, it is appropriate to provide a 5cc to 10cc syringe to inflate the ETT cuff. We should also furnish different laryngoscope blades such as a Miller 2 and Macintosh 3, this may help in case multiple airway intubation attempts are necessary. Furthermore, a size 3 LMA is should be immediately available on the cart.

Additionally, we could also supply micro laryngeal tubes which might be useful. According to Raksakietisak & Chongkolwatana (2006), "the microlaryngeal tube with a high-volume and low-pressure cuff is frequently used because it is small and long (5 mm x 31 cm) and [does

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not obscure] the view of the larynx." More than likely, the provider will not attempt to use a tongue depressor because "probing or manipulating the epiglottis with a tongue depressor or laryngoscope can cause the obstruction to worsen, and possibly close the airway" (The Free Library, 2014).

Since the patient's IV status in unknown, an IV start kit is set up. Since the patient is not critically ill, no invasive monitors are immediately necessary; however, they should be readily available should the need arise. Certainly, we should consider the possibility for further complications as "these children are acidotic, hypoxic, and hypercapnic, all conditions that are propitious for arrhythmia and hemodynamic instability" (Lichtor et al., 2016). As anesthesia technologists we must prepare for potential complications.

Potential Complications

From the moment epiglottitis is suspected, the primary concern of the medical staff is to preserve the airway. Video laryngoscopes should be charged and checked. Perhaps, the use of a video laryngoscope might suffice for this patient. However, the difficult airway cart should be placed in the room, and the fiberoptic scope prepared for immediate use. As a last step in preparation, a tracheostomy or cricothyrotomy tray should also be in the room, but unopened. Indeed, best preparation would include all of these steps prior to case start While they remain unopened, they are readily available.

In a personal interview, Merisa Bell, M.D., a pediatric anesthesiologist at Children's Hospital Los Angeles, stated that "if the patient were older, an awake fiberoptic would have been chosen first. I do not believe that a 12-year-old would be able to tolerate an awake fiberoptic, so I would most likely use a [video laryngoscope] instead". Even though "fiberoptic-guided tracheal intubation remains the gold standard for pediatric difficult airways, its use in smaller children may be challenging and necessitate inhalational induction technique" (Totoz et al., 2018). Due to the patient's condition, he has "a potential for laryngospasm and unalterable loss of the respiratory tract due to the airway edema. Early diagnosis with careful as well as quick intervention of this severe problem is essential to avoid deadly difficulties" (Altalhi et al., 2017). Furthermore, there is a potential for lung injury due to negative pressure pulmonary edema caused by forceful inspiration while the airway is obstructed (Butterworth et al., 2018). In the end, the amount of equipment in the room in use or on standby will depend on the provider.

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Plan of Anesthesia

Any anesthetic induction plan must recognize that the swelling of the epiglottis may cause total obstruction of the upper airway. In which case, the patient will be unable to spontaneously ventilate and oxygenate. Concurrently, the rapid progression of the inflammation in the glottis could result in the inability to intubate and ventilate. Anytime epiglottitis is suspected, the procedure/treatment "must be carried out in the OR while preserving spontaneous air flow. The induction may be performed with the individual resting upright. Compelling the child into a supine position could precipitate intense respiratory tract obstruction" (Altalhi et al., 2017). As stated, attempts to rescue the airway must be done in the OR where adequate equipment is present or available. In this case, the ENT surgeon is present to perform an evaluation of the airway and to perform a tracheostomy, if necessary. There is no established airway management algorithm in patients with epiglottitis, yet positioning is crucial. We would not place the patient into a supine position, because "gravity may cause total airway obstruction, thereby displacing the enlarged epiglottis both posteriorly and caudally. This causes a dilemma in airway management: optimal posture for the patient causes difficulty in implementing the necessary airway procedures. Second, patients are restless and agitated because of this breathing difficulty" (Ozaki & Murashima, 2019).

The induction of our patient will be done in sitting position. The patient will receive a cocktail of ketamine, sevoflurane, and dexmedetomidine. When giving the patient this cocktail, one of the objectives is to "maintain spontaneous ventilation" (M. Bell, M.D., personal communication, February 19, 2021). During an interview with Dr. Barry Bloom, M.D, at Kaiser Permanente Los Angeles, he stated that "breathing the patient down with sevoflurane will allow for the agitation to subside. It is important to consider that epiglottitis is

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not as common as it used to be. This particular case could very well be just croup as there is no drooling because the 4 D's of epiglottitis are not present - Dyspnea, Drooling, Dysphonia & Distress. Sometimes the anesthesiologist becomes a diagnostician. No muscle relaxants would be used to allow for spontaneous ventilation" (B. Bloom, M.D., interview, February 26, 2021). Even though per Dr. Bary Bloom, M.D. (2021), the patient's epiglottitis may not be confirmed due to the lack of drooling, based on the patient's condition and the mother's historical statements that her son has not drunk fluids for the past 12 hours, it could be determined that the patient's lack of drooling is caused by dehydration. Therefore, after the airway is secure additional crystalloids, such as 0.9% normal saline, will be needed. Drugs that decrease respiratory function are contraindicated; additionally, antibiotics will be given as they are the main treatment after securing of the airway. In this case, the antibiotic of choice would be ceftriaxone (Guerra & Waseem, 2021). In the past, the use of steroid therapy was indicated because it was thought to reduce edema. However, according to Phillips et al. (2004), many studies have shown that the steroid therapy did not reduce the need for intubation, decrease the duration of intubation, reduce the length of stay in the intensive care unit or the length of hospitalization. If steroids were to be used, hydrocortisone or dexamethasone would be appropriate in this case, according to Phillips et al.

Induction of Anesthesia

The patient is brought into the OR sitting on a gurney in a classical tripod position (sitting, leaning forward, and supporting himself with hands between his legs). Mother is present to keep her son calm and less agitated. The anesthesia technologist is on one side of the child's bed helping to keep him secured and less stressed as the arrival to the OR can be frightening. The child is moved very carefully from the gurney onto the OR table and placed into a sitting position. The anesthesia technologist supports the child's head during the transfer onto the table to ensure the least amount of manipulation and aggravation to his neck. According to Dr. Barry Bloom, M.D. (2021), there is no reason for the child to not be given sevoflurane while still on the gurney. However, it is our belief that the child should be moved onto the OR table; and that it can be done safely while the patient remains in the sitting position. The anesthesia technologist will place all ASA monitors onto the patient. These include the pulse oximeter, electrocardiograph, noninvasive blood pressure cuff, and a temperature monitor. Furthermore, assurance of IV access is crucial. In our case, the patient already has a 20g IV access that is well functioning. A 20g IV is the most common gauge seen in the OR and allows for "most infusions, rapid fluid replacement, trauma, and routine blood transfusion" (Peripheral IV Catheter Chart).

Patient has a severe stridor on his inspiratory drive. Hence, without any delay, the provider starts with a ketamine bolus to lightly sedate the patient and starts breathing him down with sevoflurane. The use of versed would be minimal or it would be used in conjunction with ketamine due to the fact that "sedation with midazolam alone was associated with a significant reduction in airway muscle activity and partial upper-airway obstruction; however, ketamine, preserved airway patency and airway muscle tone" (Deng et al., 2001). The induction is performed in the sitting position with maintenance of spontaneous ventilation under careful observation of the ENT specialist. The anesthesia technologist provides support to the child while monitoring vital signs and waiting for the steps of the provider. Once the child has relaxed due to the drugs and sevoflurane, the mother is taken out of the operating room by the anesthesia technologist while the child is quickly put into a supine position and direct laryngoscopy is attempted. No cricoid pressure is applied, however BURP maneuver during intubation by the provider can prove to be beneficial. When direct laryngoscopy is done by the provider "a cherry red epiglottis and surrounding structures will be observed. If the inflammation makes it difficult to identify the glottic opening, manual chest compressions may create air bubbles at the glottis opening and assist in the visualization of the glottis. After confirmation of bilateral breath sounds, CPAP should be maintained to decrease risk of pulmonary edema from relief of severe upper airway obstruction." (Open Anesthesia, 2021). As mentioned earlier, should direct laryngoscopy not be successful, the use of a video laryngoscope is indicated. If the patient is ventilating on his own, the provider has time to truly visualize the glottic

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opening. If the glottic opening is constricted to the point that the patient is beginning to desaturate, the decision to perform tracheostomy or cricothyrotomy must be made in concert by the ENT surgeon or the increases. The anesthesia technologist would immediately prepare the procedure kit for the anesthesia care provider. Indeed, we would help prepare the patient for either tracheostomy or cricothyrotomy and would assist the anesthesia care provider during the cricothyrotomy procedure. A tracheostomy would be handled by the surgical team, yet we would be assisting in preparation.

This patient is young and healthy; therefore, it would be customary to expect no problems during treatment. However, this case has a great potential for complications. In his state, the patient can "have a bronchospasm, laryngospasm or become hypoxic and hypercarbic" (M.. Bell, M.D., interview, February 19, 2021). This can further lead to the patient having cardiac arrhythmias if left untreated (Butterworth et al., 2018). A complete collapse of the airway can lead to respiratory failure and cardiac arrest. Indeed, the inability to ventilate or intubate is always of concern to the anesthesia care team, and in this care, it takes a whole other dimension.

Maintenance of Anesthesia

During maintenance of anesthesia, the role of the anesthesia technologist is somewhat limited. This would be the time when the ENT surgeon and the anesthesiologist make their assessments and decisions regarding the case. The anesthesia technologist is there to ensure that all monitors are functioning, IV is working, and that all necessary equipment for a possible emergency is readily available and functioning. In this case, the goal was to secure the airway. Once the airway was established, the patient is relatively safe as there is no further surgical intervention needed. However, should an emergency arise during intubation, the provider may ask to monitor the patient's arterial pressure through the arterial line. Also, placement of an arterial line would help in obtaining periodical blood gas values. The anesthesia technologist would set up the arterial line pressure monitoring kit for the provider, help the provider during the placement and securing, connection to the monitors, and the calibration procedure. Once connected to the patient, the anesthesia technologist would ensure a proper waveform. The anesthesia technologist would also participate in any potential next steps as needed. However, our assumption here in this case is that once the airway is established, the emergency has been dealt with, and the patient is on his way to recovery.

Anesthesia Emergence

Under normal circumstances, the patient can become combative during emergence due to his age and because "pain is often manifested as postoperative restlessness and agitation" (Butterworth et al., 2018). However, with epiglottitis, once the airway is secured, the patient will remain intubated and transferred to the intensive care unit (ICU). Nonetheless before the transfer to the ICU, the anesthesia provider will confirm that the patient has a "patent airway, have adequate ventilation and oxygen, and are hemodynamically stable" (Butterworth et al., 2018). According to Lichtor et al. (2016), once in the ICU, the patient will undergo antibiotic therapy with broad spectrum antibiotics such as ceftriaxone, followed by cefdinir for a 7-day course. Vancomycin and steroid therapy may be ordered. The patient may be ready for extubation once there is an indication that the treatment with antibiotics and steroids has allowed for the inflammation to subside. Typically, "most patients improve within 48-72 hours" (Guerra & Waseem, 2021). However, extubation should be done back in the OR and not in the ICU, because "the ideal method of extubation is one that permits a withdrawal from the airway that is controlled, gradual, step by step, and reversible at any time" (Benumof & Hagberg, 2007). The patient will be assessed prior to extubation, in which clinicians "should take into account the cause of the patient's respiratory failure, prognosis, and expected course of the disease, as well as the absence of any reasons to stay on mechanical ventilation for a longer time" (Saeed & Lasrado, 2021). When these assessments are complete and the patient has "successfully passed the spontaneous breathing trial, they should be extubated unless management plans change" (Saeed & Lasrado, 2021). The anesthesia technologist must verify that suction is nearby and fully functioning since "regardless of whether the tube is removed when the patient is deeply anesthetized or awake, the patient's pharynx should be thoroughly suctioned before extubation to decrease the potential for aspiration of blood and secretions" (Butterworth et al., 2018). The anesthesia provider will, "check for an air leak when assessing any child for extubation readiness and the same should apply to determine extubation readiness for a patient with epiglottitis" (Lichtor et al., 2016). Checking for a leak will indicate whether or not there is airway edema. Leak is indicative of airway edema. If there is a small leak, this is indicative of no airway edema and "extubation can be entertained" (Guerra & Waseem, 2021).

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Conclusion

Anytime epiglottitis is suspected, it must be treated as a medical emergency. As described, despite the possibility of differential diagnosis, the anesthesia technologist must be ready for the worst. Communication with the providers regarding their needs and expectations in any case, whether emergency or not, is key. Additionally, being prepared, thorough, and attentive to detail, while utilizing current techniques, knowledge, and skills completes the anesthesia team. Furthermore, it improves the rate of success for the patient and improves the overall quality of care.

References

Altalhi, W., Makin, A., Kalakattawi, R., Khubrani, Y., Alqurashi, N., Darbashi, S., Sambawah, M., Ageeli, M. Reviewing the diagnosis and treatment approaches of epiglottis. *International Journal of Scientific & Engineering Research* Volume 8, Issue 11, November-2017 **Reviewing the diagnosis and treatment approaches of epiglottis (ijser.org)**

APSF Newsletter Volume 23, No. 1 • Spring 2008

Bell, Merisa (2021, February 19). Children's Hospital Los Angeles. Personal communication [in-person interview].

Benumof, J., Hagberg, C. A. (2007). The American Society of Anesthesiologists' Management of the Difficult Airway Algorithm and Explanation-Analysis of the Algorithm. *In Benumof's Airway Management: Principles and Practice* (Second, pp. 236–251). essay, Mosby.

Bloom, B. (2021, February 26 at 9:55 am). Kaiser Permanente Los Angeles. Personal communication [in-person interview].

Butterworth, J. F., Mackey, D. C., & Wasnick, J. D. (2018). *Morgan & Mikhail's Clinical Anesthesiology* (6th ed.). McGraw-Hill Education.

Deng,X.M., Xiao, W. J., Luo, M. P., Tang, G.Z., Xu, K.L., (2001) The Use of Midazolam and Small-Dose Ketamine for Sedation and Analgesia During Local Anesthesia, Anesthesia & Analgesia. *International Anesthesia Research Society* November 2001 - Volume 93 - Issue 5 - p 1174-1177 **The Use of Midazolam and Small-Dose Ketamine for Sedation an... : Anesthesia & Analgesia (lww.com)**

Eipe, N., Barrowman, N., Writer, H., & Doherty, D. (2009). A weight-based formula for tracheal tube size in children. *Paediatric anaesthesia*, 19(4), 343–348. **A weight-based formula for tracheal tube size in children - EIPE - 2009 - Pediatric Anesthesia - Wiley Online Library**

Ehrenwerth, J. (2013). Anesthesia Equipment: Principles and Applications. United Kingdom: Elsevier - Health Sciences Division.

Epiglottitis: Airway management (2021) *Open Anesthesia* **Epiglottitis: Airway management (openanesthesia.org)**

Epiglottitis: Symptoms, causes, treatments. (2018, June 18) **https://my.clevelandclinic.org/health/diseases/17844-epiglottitis**

Guerra A.M., Waseem M., Epiglottitis. [Updated 2021 Feb 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan. Available from: **https://www.ncbi.nlm.nih.gov/books/NBK430960/**

Laryngotracheobronchitis and epiglottitis.. (n.d.) >*The Free Library.* (2014). Retrieved Mar 09 2021 from **https://www.thefreelibrary.com/Laryngotracheobronchitis+and+epiglottitis.-a0139951944**

Leslie, D., & Stacey, M. (2014). Awake Intubation. *Continuing Education in Anaesthesia Critical Care & Pain, 15*(2), 64–67. **https://academic.oup.com/bjaed/article/15/2/64/248570**

Lichtor, J.L., Rodriguez, M.R., Aaronson, N., Spock, T., Goodman, T.R., Baum, E.D.; Epiglottitis: It Hasn't Gone Away. *Anesthesiology* 2016; 124:1404–1407 **Epiglottitis | Anesthesiology | American Society of Anesthesiologists (asahq.org)**

Ozaki, M., & Murashima, K. (2019). Use of a Tracheal Tube as a Nasally Inserted Supraglottic Airway in a Case of Near-Fatal Airway Obstruction Caused by Epiglottitis. *Case reports in anesthesiology, 2019*, 2160924. **https://doi.org/10.1155/2019/2160924**

Pedagogy Online Learning Systems. Peripheral IV Catheter Chart. **https://www.pedagogyeducation.com/Correctional-Healthcare-Campus/Resource-Library/Infusion/Peripheral-IV-Catheter-Chart.aspx**.

Phillips, J.S., Innes A.J., Naik M.S. (2004). Corticosteroids for supraglottitis, *BJA: British Journal of Anaesthesia*, Volume 92, Issue 3, March 2004, Pages 454–455, **https://doi.org/10.1093/bja/aeh527**

Raksakietisak, M. & Chongkolwatana, C. (2006). Acute Epiglottitis: A Report of the Two Different Methods of Airway Management in Adults. **https://www.researchgate.net/publication/6587503_Acute_epiglottitis_A_report_of_the_two_different_methods_of_airway_management_in_adults**

Saeed, F., & Lasrado, S. (2021, January 8). *Extubation.* StatPearls [Internet]. **https://www.ncbi.nlm.nih.gov/books/NBK539804/**.

Totoz, T., Erkalp, K., Taskin, S., Dalkilinc, U., & Selcan, A. (2018, October 21). Use of Awake flexible fiberoptic BRONCHOSCOPIC nasal intubation in secure airway management for reconstructive surgery in a PEDIATRIC patient with Burn Contracture of the neck. **https://www.hindawi.com/journals/cria/2018/8981561/**.

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Continuing Education Quiz

To test your knowledge on this issue's article, provide correct answers to the following questions on the form below. Follow the instructions carefully.

1. Which medications are contraindicated during induction for patients with epiglottitis?
a. Succinylcholine and Fentanyl
b. Ancef and Atropine
c. Fentanyl and Ancef
d. Atropine and Succinylcholine

2. What was the optimal induction position for a patient with epiglottitis?
a. Supine
b. Reverse Trendelenburg
c. Modified lateral decubitus
d. Sitting

3. What are the clinical signs of patients with epiglottitis?
a. Stridor
b. Drooling
c. Anxiety
d. All of the above

4. After the infection and airway edema subsides, extubation of the patient will occur in which area?
a. ICU
b. PACU
c. OR
d. Pre-op area

5. Another differential diagnosis of epiglottitis is:
a. Asthma.
b. Croup.
c. Whooping cough.
d. Laryngitis.

6. Doing an inhalation induction sevoflurane will allow for:
a. Bronchodilation and decrease in agitation
b. Increased peak airway pressure
c. Vasoconstriction
d. All of the above

7. A small lumen endotracheal tube should be used to:
a. enhance the view.
b. accommodate the airway edema.
c. insure a secure fit.
d. decrease airway trauma.

8. What is the position usually preferred by patients with an undiagnosed epiglottitis?
a. Lateral
b. Sitting in tripod position
c. Standing
d. Supine

9. What anatomical condition of the epiglottis will be viewed with a laryngoscopy?
a. Deviated
b. Swollen, cherry red
c. Normal
d. Bleeding

10. Obstructed inspiration and a swollen glottic opening during an epiglottitis can cause:
a. negative pressure pulmonary edema.
b. "barking cough" sounds in a patient.
c. wheezing sound on expiration.
d. positive pressure pulmonary edema.

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1:	A B C D		**6:**	A B C D	
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3:	A B C D		**8:**	A B C D	
4:	A B C D		**9:**	A B C D	
5:	A B C D		**10:**	A B C D	

Quiz 2 of 2

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