

20 Questions – Respiratory Distress

1. What are some causes of hyperventilation?
2. The average age for epiglottitis is...?
3. Name the most common bug causing pneumonia in the teenage/young adult (and no, 50 doesn't qualify as young adult), and some of its complications.
4. Why do patients with primary hyperventilation get clenched hands and feet?
5. What is the most common error when ventilating an intubated asthma patient?
6. An asthma patient is in respiratory arrest upon your arrival; what should you do?
7. Are nebulizers better than metered dose inhalers?
8. You are called for a 22yo patient with 'bronchitis' for the past week who is having spasms of coughing which leave him breathless. Any attempt at deep breathing triggers a fit of coughing. You do not hear any wheezes and he has no past medical history. What can you do?
9. You are called for a SOB and find an obese, pregnant young woman smoking a cigarette. She is hypoxic, and states that her symptoms began abruptly 30 minutes ago. What is a likely diagnosis and some additional risk factors?
10. What are some symptoms you could look for with a PE?
11. The best treatment for primary hyperventilation is...?
12. What percent of patients with deep venous thrombosis have a PE?
13. How do you treat pulmonary embolus?
14. Why do patients with primary hyperventilation continue to breathe so fast?
15. What the heck is platypnea?
16. When people complain that they are short of breath, how many will have a serious cardiac or pulmonary disorder?
17. Why can people get a pneumothorax without trauma?
18. How big a pneumothorax can you have without any symptoms?
19. You have just assisted with delivery of a healthy infant in a patient's house. Suddenly, the mother turns gray and clutches her chest. Her O2 sat is in the 70s. What could have happened?
20. Why does CPAP help pulmonary edema?

20 Answers – Respiratory Distress

1. Trick question! Primary hyperventilation is its own "disease" and occurs when a young, usually female patient breathes too deeply and too fast. It is self-sustaining, (will continue until coached, medicated, or the patient passes out), not dangerous, and associated with severe anxiety. Think of hyperventilation as a cause of TACHYPNEA and remember that the same symptoms can occur with many underlying disease processes. A few examples – compensation for severe acidosis (from diabetes, drugs, pancreatitis, and other causes), hypoxia (pulmonary embolus, anemia, pneumonia, for example), increased work of breathing (COPD, asthma, pulmonary edema, obstruction with foreign body, anaphylaxis, pulmonary fibrosis, pulmonary contusion), and other causes from neuromuscular disease to toxic gas inhalations.

2. Another tricky question! This should have been the Halloween issue. Though we think of classic epiglottitis occurring in the 4-7 year old age range, vaccination against H. influenza b has meant that the average age is now 25 years old! In adults, epiglottitis presents with severe sore throat with more slowly progressive obstruction than in children. The potential for disaster in an adult who is at the point where they can't swallow and are having trouble breathing is still very high! Talk it over with medic control, an epi neb may be useful...
3. Mycoplasma pneumonia ("walking pneumonia") accounts for 25% of all pneumonias, and up to 40% in this age group. It usually is an afebrile pneumonia with sharp cough, little sputum, and often chest discomfort and headache. Varied and bizarre stuff can occur such as: meningitis, bullous myringitis, respiratory failure, Guillain-Barre syndrome (ascending paralysis), hemolytic anemia, hepatitis, pericarditis, myocarditis, and high-grade AV block. Nasty!
4. Tachypnea results in extra CO₂ being blown off, which shifts the body pH toward alkalosis. As the body fluids get alkaline, calcium is bound to proteins. The resulting hypocalcemia results in the carpopedal spasm (essentially, tetany) that is seen.
5. Bagging too fast. Make sure to listen to the chest frequently to make sure the wheezing stops before the next breath. Start with a rate of 8/minute which is tough when your adrenaline is going! If resistance is increasing, disconnect the bag and make sure all the air gets out of the lungs as if your tidal volume or rate is too much you will keep increasing pressure in the chest since the patient never exhales completely. You can even use compression to the lateral chest wall to help force air out if needed.
6. Administer 0.25mg sq terbutaline, intubate, bag at 8 breaths per minute, consider manual exhalation assistance, and call for orders. Epinephrine 1:10,000 0.5-1cc is appropriate as an IV dose, this may need to be repeated...Once you have access to 2 oxygen connectors, an in-line neb of albuterol / atrovent is advisable. You may also get orders for IV atropine, bicarb, and mag, so you may wish to get these ready or ask for them! Good luck!
7. No. Multiple studies have compared the two and find that MDIs are just as effective as nebulizers, as long as they are given with a spacer. We can even use special masks to give MDIs to children as young as 6 months.
8. Try a neb! Bronchitis (i.e. viral infections) can trigger bronchospasm in a significant percent of the population, often it is cough-variant, meaning the cough is predominant and little wheezing is heard, though you may hear more once you can get him to take a deep breath!
9. This is a great story for a pulmonary embolus. Not many would miss this presentation. We don't think about this often enough in older patients, especially those with known heart failure (especially), COPD, and those with an MI hx. Other predisposing factors: hx of DVT, immobilization, cancer, on estrogens, recent surgery, trauma, or leg injury, and coagulation problems including those associated with lupus, homocystinuria, and others.
10. The most common sign in PE is tachypnea (92%), the most common symptom is chest pain (88%), closely followed by dyspnea (84%). Interestingly, only 44% are tachycardic (>100), and even fewer are hypoxic. Tachycardia, hypoxia, and syncope are associated with LARGE pulmonary emboli. Finally, fever and cough are common with PE a few days after the initial clot, but often mistaken for pneumonias!
11. Reassurance. Usually, the patient's eyes are closed and they won't talk. Try to get them to open their eyes and talk to you. If you are convinced that they have simply primary hyperventilation, coach them to breathe only when you tell them to, and count to 5, breathe, etc. Rarely is rebreathing needed. Rebreathing can be a problem because the CO₂ is so low after a few minutes of hyperventilating that it can take a LOT of rebreathing to get up to levels that will help break the "spell".

12. At least 30% of patients with DVT have PE by lung scan, though only about 25% of these patients actually have symptoms of PE.
13. O₂ is the only prehospital therapy. We'll start heparin, which prevents further clot from forming, and consider thrombolytics if the patient is unstable (full dose) or having complications (half-dose). In an arrested patient with a probable PE we might try high-dose thrombolytics.
14. Cerebral vasoconstriction induced by the alkalosis (the same thing we're aiming for in head injured patients) goes too far, causing the brain cells to get too little blood flow, and thus, too little oxygen despite normal O₂ sats. Because of this, the brain continues to encourage the body to breathe faster, until the patient either passes out or is coached out of the abnormal breathing pattern. So in fact, giving supplemental oxygen to a patient like this won't hurt, and might even help!
15. Where orthopnea is dyspnea with lying down (often due to heart failure, pericarditis, diaphragmatic paralysis, and COPD), platypnea is the very uncommon dyspnea with standing up, and is caused by major loss of abdominal wall tone (eg: paralysis), and occasionally by defects in the heart wall between the atria (patent foramen ovale), etc. Good question for your paramedic student when they get a little confident!
16. At least 2/3. This is an interesting comparison to chest pain, in which only about 20% will have a significant cardiac or respiratory problem.
17. Many people have blebs right next to the pleura, they can be congenital, or associated with obstructive disease (asthma, COPD). These can rupture into the pleural space when the lungs are stressed. Tall males tend to exert higher negative pressures on their lungs during inspiration which is why they're at increased risk. This usually occurs between the ages of 20-40. Most people with spontaneous PTX are smokers. Also, AIDS patients with PCP pneumonia are at increased risk. Unfortunately, the recurrence rate is 20-50% (so a history of one of these can be VERY helpful!)
18. Generally, 10-20% collapse of a lung doesn't result in any symptoms (and also doesn't change the chest exam!) for the patient. Even with tension pneumothorax the lung sounds may seem equal!
19. Amniotic fluid embolism presents just like PE and may occur around or shortly after delivery, it occurs when amniotic fluid is forced into the maternal bloodstream (across the placenta or through a uterine tear). Luckily, it is very rare, unlikely it has a high chance of causing death.
20. When a patient has fluid in the lungs (may be due to CHF, narcotics/other overdoses, volume overload in a dialysis patient, and other causes) and the patient exhales the air out of the alveoli, the alveoli collapse and the surface tension of the fluid present means it takes more force to 'pop' them back open again when trying to take the next breath. By providing a low but constant amount of air pressure during exhalation, CPAP keeps the alveoli from collapsing completely and thus, decreases the work of breathing. BiPAP, which we use in the ED just allows us to use a higher pressure during inspiration to help the breath go in as well as providing the constant exhalation support.

Happy Fall! Turkey time is coming...