Hypoxia
2/12/17

ED Hypoxia =

- <94% SaO2 without lung pathology
- <90% SaO2 with lung pathology

If the patient is hypoxic, then they need oxygen administration!
Attempt least invasive measures first unless patient is doing really poorly.

Approach to O2 administration:

1. **Nasal cannula (NC):** Titrate from 1-6L/min (~24%-44% FiO2). Usually start at 2L/min.
2. **Venturi mask** ('venti mask')
   - Has a bag of colorful adaptors, swap them to change FiO2 with O2 flow adjustment
   - Try 10L/min (red adaptor; 40% FiO2) or 15L/min (green adaptor; 60% FiO2)
3. **Non-rebreather mask (NRB)** = 100% FiO2 (the one with a floppy bag on it) and needs >15L/min O2 flow to work properly
4. **BPAP and CPAP** (NPPV = non-invasive positive pressure ventilation): 21% - 100% FiO2
   - Adds positive pressure -> CPAP: P insp = P exp …. BiPAP: P insp > P exp
   - Use often in patients with COPD or CHF. Decreases work of breathing and increases ventilation (PEEP helps keeps alveoli open)
   - Aspiration risk if pt not awake
5. **Intubation:** for patients that fail attempts at other devices or are doing really poorly

Quick Facts

- FiO2 = fraction of inspired oxygen, atmospheric (room air) is 21% at sea level.
- Increase oxygen administration by increasing FiO2.
- **Hyperoxia is bad and can kill people. It's a bad idea to put oxygen on pts having MI/severe illness if they are not hypoxic! Further reading in references below.**
- *FiO2 for NC is roughly atmospheric oxygen (21%) + 4% per liter.* Using 20% makes easy math, and it's an estimate anyways =) So **2L is equivalent to about 28% FiO2.**
- Ask a nurse/MD: where is a venti, NRB, bag mask and how do I use them + set them up?

References

• Retrospective US study. Patients with hyperoxia (PaO2 ≥300 mm Hg) had significantly higher in-hospital mortality (63%) compared with the normoxia group (45%) and the hypoxia group (57%). Hyperoxia = bad.

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• Meta-analysis of animal trials. Hyperoxia = bad

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• Randomized prospective trial. Hyperoxia during STEMI = more recurrent MI/dysrhythmias. Hyperoxia = bad

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