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# ***Oxygen Administration Assessment***

**The patient is hypoxemic.**

**What is the cause of the  
Hypoxemia?**

**What is the best way to  
treat it?**

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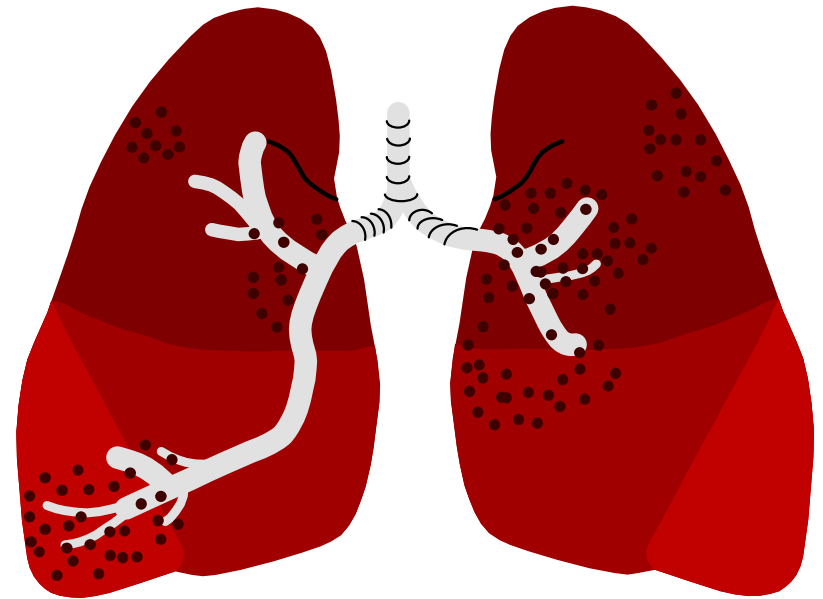
# *The Causes of Hypoxemia:*

- ◆ Hypoventilation
- ◆ Diffusion Defect
- ◆ True Shunting:
  - Anatomical
  - Pulmonary
- ◆ Shunt-like Effect
  - Maldistribution of ventilation
- ◆ Decreased Cardiac Output ( $<P_{V}O_2$ )
- ◆ Decreased  $PIO_2$ :
  - Altitude ( $<P_B$ )
  - Decreased  $FIO_2$

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# *Basic Concepts:*

- ◆ Hypoventilation on R.A. will cause hypoxemia ( $< \text{age PaO}_2$ )
  - $\text{PaO}_2 + \text{PaCO}_2 = 135$  if cause is hypoventilation.
- ◆  $\text{PAO}_2 + \text{PACO}_2$  are reciprocal.



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# ***Diffusion Defect:***

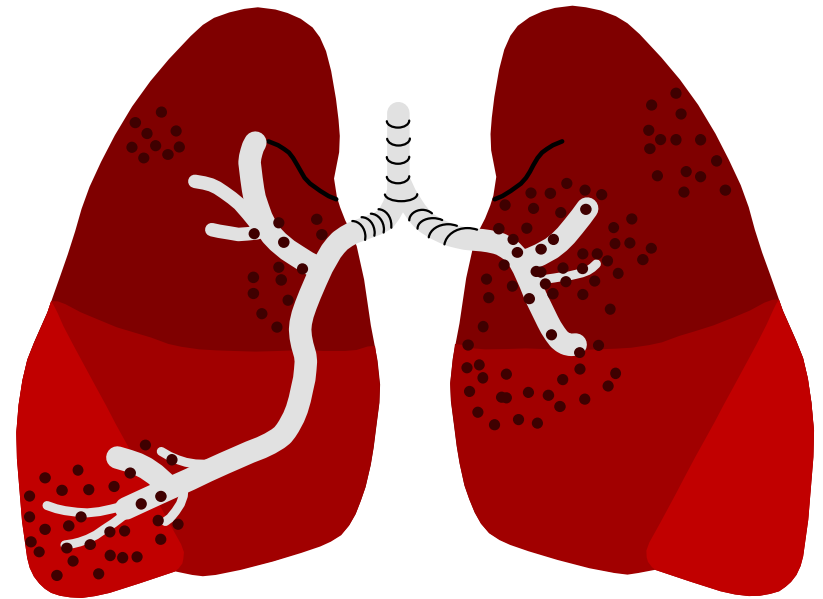
- ◆ A-aO<sub>2</sub> will be widened on R.A. but not add to 135 and when given high FIO<sub>2</sub> the A-aO<sub>2</sub> will be smaller than on R.A.
- ◆ > FIO<sub>2</sub> will almost completely correct A-aO<sub>2</sub>.



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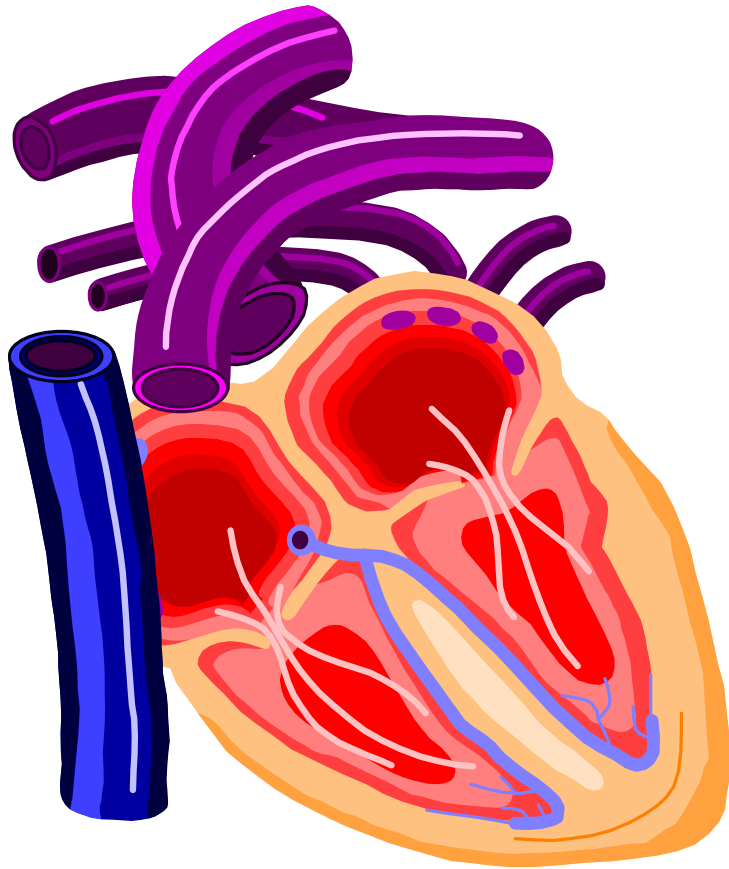
# ***Shunting:***

- ◆ Perfusion without ventilation.
  - (deadspace is ventilation without perfusion)
- ◆ Will cause a widened  $A-aO_2$  on R.A. and when an  $>FIO_2$  is given will get even wider.



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# *True Shunting:*

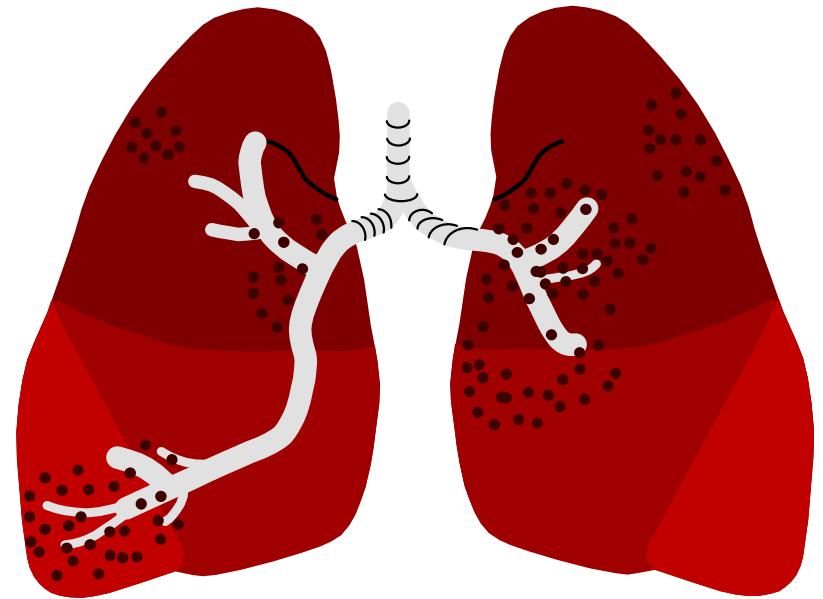


- ◆ Anatomical :
  - Right to left shunting of venous blood causing a drop in  $\text{PaO}_2$ .
  - Usually an at birth defect(cardiac).
  - Surgical correction is usually required.
- ◆  $\text{O}_2$  breathing of little value.

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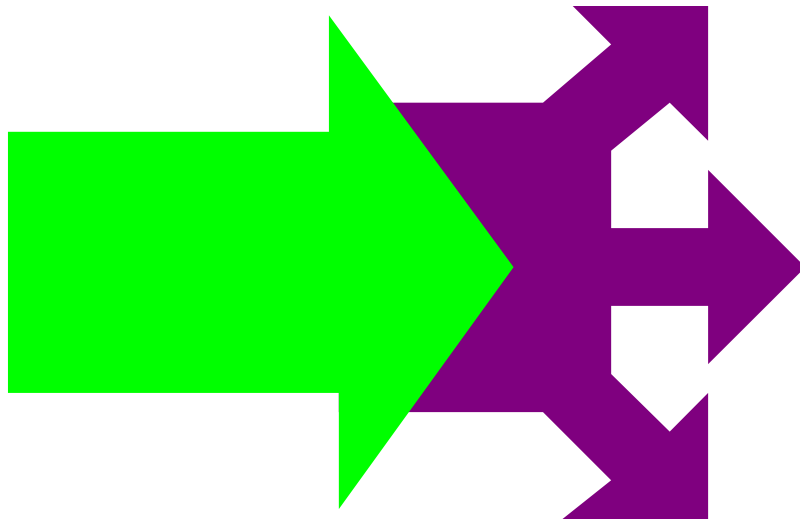
# *True Shunting:*

- ◆ Pulmonary:
  - A-aO<sub>2</sub> will be widened on R.A. and will increase when an increased FIO<sub>2</sub> is given.
- ◆ PaO<sub>2</sub> will not increase very much in response to O<sub>2</sub> breathing.



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# ***Shunt-like Effects:***



- ◆ A-aO<sub>2</sub> will be widened on R.A. and will respond to an increased FIO<sub>2</sub> .
- ◆ A-aO<sub>2</sub> will improve more than with true shunt but not as much as with diffusion defect.

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*Decreased  $P_{VO_2}$*   
*Decreased  $PIO_2$*

- ◆ Decreased  $P_{VO_2}$ :
  - Drop in cardiac output.
  - Increased desaturation of returning venous blood.
- ◆ Decreased  $PIO_2$ :
  - Drop in barometric pressure.
  - Drop in  $FIO_2$  .

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# ***Problem:***

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***FIO<sub>2</sub> .21, PaO<sub>2</sub> 55, PaCO<sub>2</sub> 35***

***Then, FIO<sub>2</sub> .80, PaO<sub>2</sub> 500, PaCO<sub>2</sub> 40***

- ◆ Does this patient have Hypoxemia?
- ◆ What is the primary cause?
- ◆ Explain?
- ◆ How would you proceed?
- ◆ How will you know if that is correct therapy?

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# ***Problem:***

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***FIO<sub>2</sub> .21, PaO<sub>2</sub> 55 PaCO<sub>2</sub> 85***

***Then, FIO<sub>2</sub> .80, PaO<sub>2</sub> 175, PaCO<sub>2</sub> 90***

- ◆ Does this patient have Hypoxemia?
- ◆ What is the primary cause?
- ◆ Explain?
- ◆ How would you proceed?
- ◆ How will you know if that is correct therapy?

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# ***Problem:***

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***FIO<sub>2</sub> .21, PaO<sub>2</sub> 55, PaCO<sub>2</sub> 35***

***Then, FIO<sub>2</sub> .80, PaO<sub>2</sub> 75, PaCO<sub>2</sub> 35***

- ◆ Does this patient have Hypoxemia?
- ◆ What is the primary cause?
- ◆ Explain?
- ◆ How would you proceed?
- ◆ How will you know if that is correct therapy?

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# ***Problem:***

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***FIO<sub>2</sub> .21, PaO<sub>2</sub> 55, PaCO<sub>2</sub> 30***

***Then, FIO<sub>2</sub> .80, PaO<sub>2</sub> 175, PaCO<sub>2</sub> 42***

- ◆ Does this patient have Hypoxemia?
- ◆ What is the primary cause?
- ◆ Explain?
- ◆ How would you proceed?
- ◆ How will you know if that is correct therapy?

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# ***Problem:***

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***FIO<sub>2</sub> .21, PaO<sub>2</sub> 55 PaCO<sub>2</sub> 35***

***Then, FIO<sub>2</sub> .80, PaO<sub>2</sub> 175, PaCO<sub>2</sub> 40***

- ◆ Does this patient have Hypoxemia?
- ◆ What is the primary cause?
- ◆ Explain?
- ◆ How would you proceed?
- ◆ How will you know if that is correct therapy?

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***TAKE A BREAK!***

