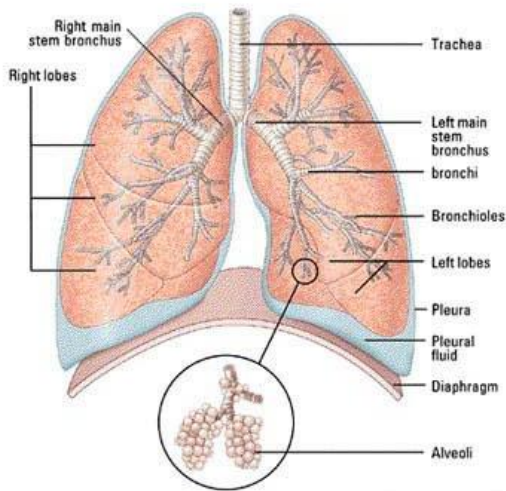
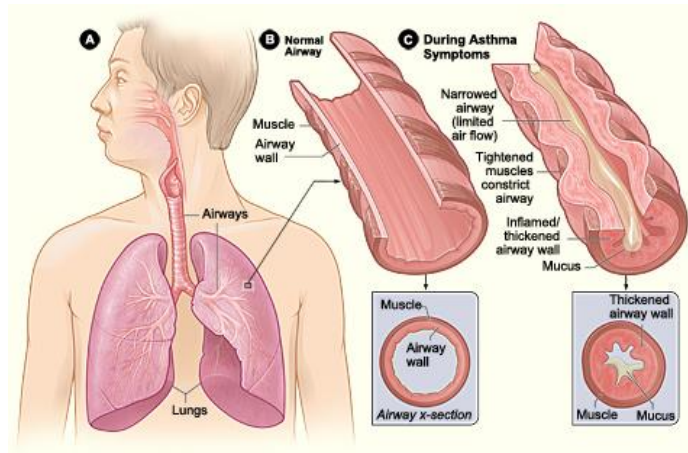


Lungs



(<http://www.cic-caracas.org/departments/science/Topic5.php>)

Medical Problem: Asthma, a lung disease causing inflammation and narrowing of the airways.



(http://www.nhlbi.nih.gov/health/dci/Diseases/Asthma/Asthma_WhatIs.html)

Modeling Lungs Activity

Supplies needed:

- 2 liter bottle
- 2 balloons
- 2 bendy straws
- Scissors
- 3 rubber bands
- clay
- 1 produce bag
- binder clip

Directions:

1. **Chest:** Carefully cut the bottom off the 2 liter bottle.
2. **Trachea (main airway) and lungs:** Attach a balloon to the bend of each straw using rubber bands.
3. Place the straws together, the balloons pointed away from each other. Position the straws in the neck of the bottle, with a little bit of straw above the bottle top.
4. Close off the top of the bottle and the area surrounding the sides of the straws with clay. No air should be able to get into the bottle from the top except through the two straws.
5. **Diaphragm:** Place produce bag carefully over the bottom of the bottle and secure it with a rubber band.
6. Pull a bit of the bag and attach the binder clip.
7. **Breathing:** Pull on the binder clip to inflate the balloons and push on the binder clip to deflate the balloons.
8. What are some ways to increase the air flow into your model lungs?

Now Model an Asthmatic Lung

1. With your knowledge about the difference between asthmatic and healthy lungs, find a way to model asthma in your lung model.

Questions:

1. What differences in the models do you observe?
2. Why should we use model representations in bioengineering?
3. What could we do with models after they are developed?