

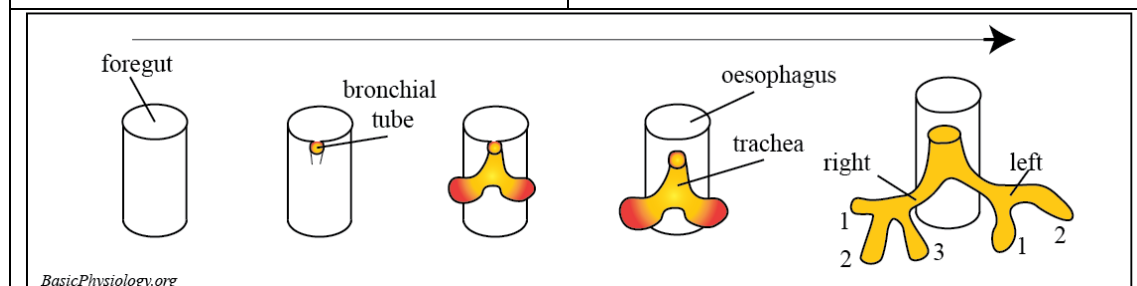
G.6.2.2. Fetal Pulmonary System

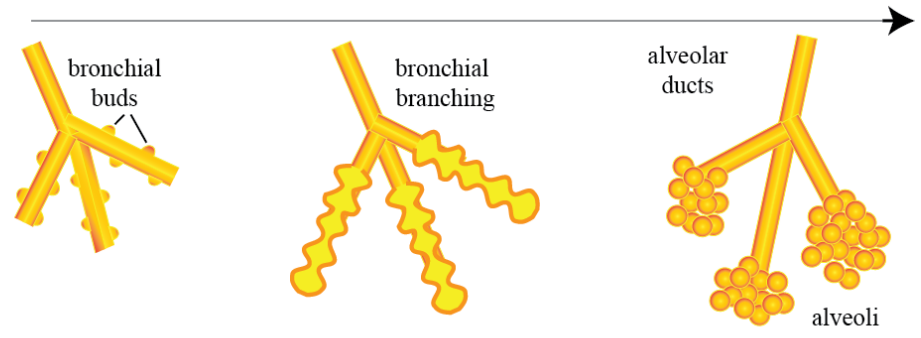
A. Introduction:

1. Now we come to another wonder of pregnancy; the foetal lungs!	2. The lungs (= pulmonary system) must develop during the embryonic/foetal period so that it is ready when the baby is born!
3. Because, what is one of the first things that a baby has to do when it is born? BREATHE!	4. If the baby does not immediately start breathing, then it will die, very, very quickly.
5. Therefore, the pulmonary system must have developed during pregnancy to be able to achieve this.	6. But how can the lungs develop if it can not breathe during pregnancy? This is what we will now discuss.

B. Pulmonary Development:

1. You may remember that one of the first structures in the embryo is the foregut.	2. Already in the embryonic stage, from the foregut, a new ventral 'bud' emerges; a tiny bronchial tube.
3. This location is very important and the two structures (gut and lungs) will remain connected to each other. Why?	4. Remember the connection between the trachea and the oesophagus; in the larynx? After all, in the larynx (and the mouth) both food and air must be able to pass. Now you can see where this all started; as a bud in the foregut!
5. The bronchial bud/tube develops rapidly, as shown in the figure, into two bronchial buds left and right. Interestingly, after 1-2 weeks, three buds develop onto the right bud but 'only' two develop in the left bud. Why?	6. Because this is the beginning of the right and left lungs and their lobes; three lobes in the right lung and two in the left lung! Remember?



7. In the next few weeks, these buds quickly develop into branches, the future bronchi. And, on these developing bronchi, new buds appear.	8. These new buds quickly develop into alveoli, where in the future, the air will flow and exchange oxygen and CO₂ with the blood circulation.
	

C. Foetal breathing:

1. It must be obvious that the foetus must exercise its respiration system before birth! You cannot suddenly start the whole system from immobility to breathing within a few minutes.	2. Therefore, the foetus must already 'breathe' in the uterus. Bu there is no air in the uterus! Therefore, it must breathe uterine fluid in and out to exercise its pulmonary system; muscles, bronchi and alveoli!
3. The first breathing movement already occurs at about 12 weeks weeks and by 24-26 weeks, the pulmonary system is sufficiently developed to breathe air when the baby is born!	4. In the second half of pregnancy, the number and size of alveoli continue to increase, their membrane becomes thinner and the amount of surfactant also increases.
5. It must be stressed that the breathing movements, in the uterus, aver quite small, more like hiccups.	6. And, because there is no air in the uterus, the trachea, bronchi and the compressed alveoli are filled with (uterine) fluid.
7. In addition, the lungs are not expanded but deflated.	8. But, when the baby is delivered, all the fluid in the lungs disappear very quickly as it is rapidly absorbed into the pulmonary circulation.