

Exam 11

Mar 31st Monday

Hypertension

- Chronic increase in BP
 - Usually due to increase peripheral resistance (even though we have millions of people dying from hypertension, we don't know the exact places the resistance could be, can't get the cause, can't treat it; fortunately we know the most often places)
 - Cause often unknown, sometimes kidneys (To check the kidneys) (why kidney??)
- Leads to ventricular hypertrophy
 - Summer icecream one of their arms is big one is not so big, when the heart is trying to push harder, the heart get bigger
 - (Biceps, huge biceps, can't touch their face: the muscle get in the way to do the contraction! Waking up to find they have issues, heart have issues, their lungs cant expand)

Blood component overview

- Plasma
 - Components: water (90%) (50:50?? Glorified Plum...??) liquids at least to be around 55%, and plasma proteins
 - Albumin (maintaining pH, and BP osmolarity in our flow), immunoglobulins (the antibodies), fibrinogen (have we seal damages on cardiovascular system)
 - Transport materials and heat (Temp impacting how the heart work, when we are hot, send the heat to the surface)
 - Maintain BP and pH
 - Provide immunity and clotting (not just the fluid, have functions)
- Blood cells
 - Leucocytes (leuco-white) (immune system)
 - Erythrocytes (RBC) (latin)
- Platelets
 - Participate in hemostasis (need the blood to stay in the vessel don't want it to go out of the system, the system it fix its own damage components)

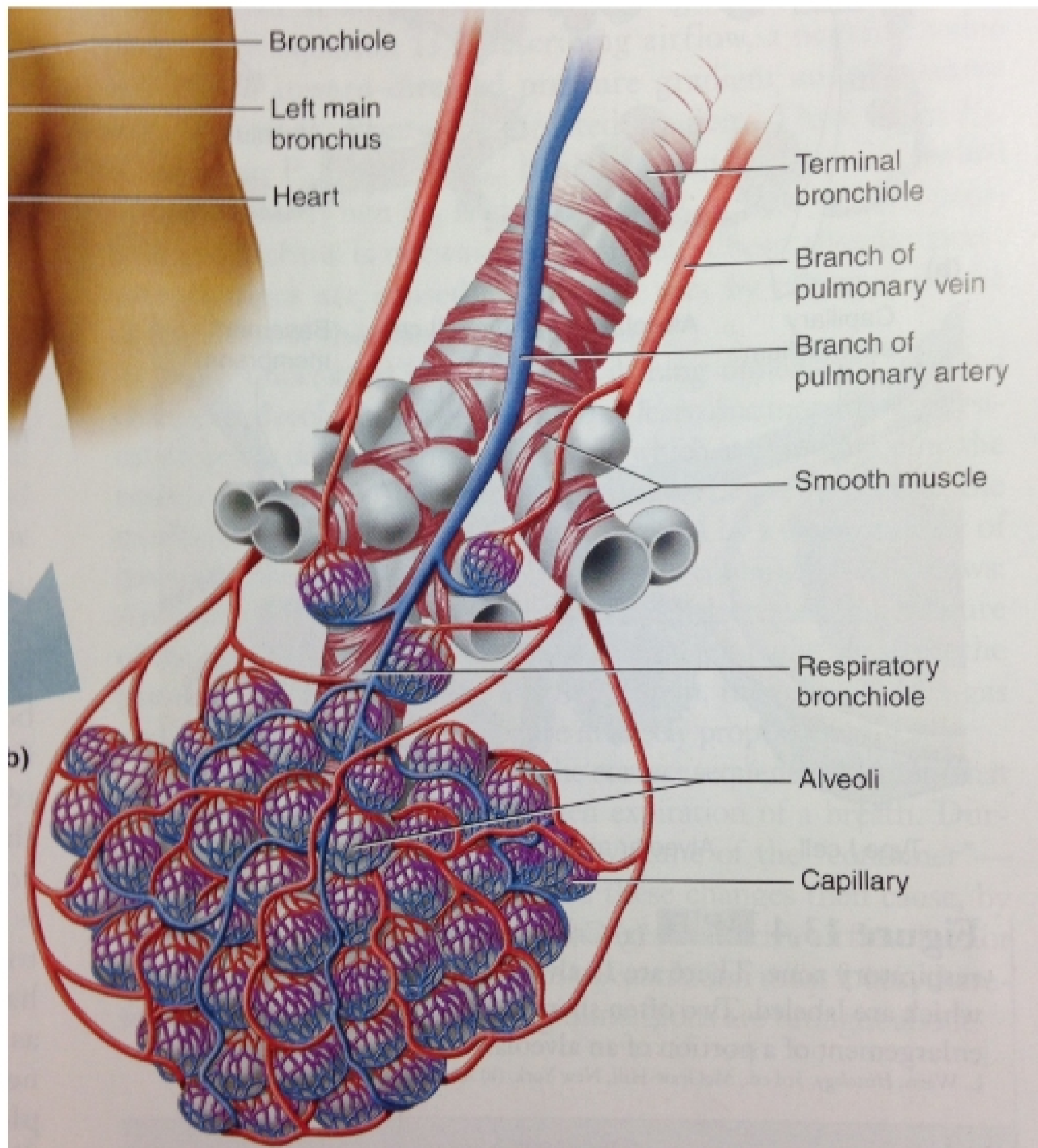
Erythrocytes

- Small ($5-7 \times 10^{-6}$) (blood vessels: one cell a time, want the cell to be as small as possible)
- Lack nucleus and organelles (get kicked out, lost all sorts of repair capacity, so short time, not be able to fix, glycolysis problem? Only have one thing built to them)
- Biconcave ellipse (push in on both sides to their middle. Why?)
 - maximize surface area helps to do diffusion better)
 - min width have to get thru the capillaries)
- primary function = transport O₂ to the cells and take CO₂ away from the cells. Moving O₂?? O₂ nonpolar, the cell is not a barrier for it, how do we keep it in? strap the O₂ in!!
 - Hemoglobin (Hb)(go thru???) have the capacity to carry 4 O₂, (also CO₂, H⁺, CO)

- Lifespan ~ 120 days (without nucleus, cant repair when get damaged, constantly replacing and making new BC) → needs replacing (need to know how we replace)
- Erythropoiesis: process of replacing
 - Where bone marrow (special cells ??)
 - Rate: 2-3 million RBCs per second (making and replacing during the lecture time)
 - Needs: (brownie: sugar, flour, water, eggs, chocolate...)
 - Iron: key component of Hb, vitamin B12, and folic acid (females who were pregnant take this to make sure they and their baby have enough Hb)
 - Erythropoietin (communicate): happen as result of the Kidney E (do we have enough components?)
 - Dropped[O₂] → kidney release more EPO (take ~ have more BC and do more activities, but cheating!) → more RBCs, hopefully do a -ve feedback
- Removal of old RBCs (happen in 2 location and decide whether to keep RBCs)
 - Where: spleen and liver
 - Bilirubin is produced by breakdown of Hb (give distinctive color, yellow, if we can't get rid of the bilirubin, get yellow, an issue!)
- Deficts → anemie (not enough or not able to do job well) → O₂ carrying capacity (rely on anaerobic) (many ways we can end up having anemia)
- Forms of anemia (decrease RBCs r bad Hb, most people think anemia=nutritional anemia)
 - Nutritional: (iron) dietary deficiency of Fe
 - Pernicious: inability to absorb B12 in gut, just like Ca, need to pull the iron out (we need to get them shot, put the B12 in, inject)
 - (follicular ~is not one of the main categories, just for pregnant)
 - Aplastic: insufficient amount of bone marrow
 - Renal: insufficient erythropoietin
 - Hemorrhagic: excessive blood loss (removing too fast, pressure issue, doesn't affect their O₂ carrying ability...)
 - Hemolytic: excessive RBC destruction
 - Having the right # of BC but cant do their jobs: sickle cell: 9genetic mutation of Hb structure, sickle shape, not easy to go thru, not getting flow in areas, one single part of the protein)

April 4th Friday

Two zones: conducting and respiratory figure 13-3



- Respiratory
 - Parts
 - Respiratory bronchioles
 - Alveolar ducts
 - Alveoli
 - Characteristics
 - Gas exchange (D)
 - Thin walled
 - Highly vascularized
- Two types of alveolar cells
 - Type I: gas exchange (B, because they are thin. Why do we have the type A cells? -->)
 - Type II: surfactant (why isn't everything thin? The medium inside of the alveoli is air, the medium inside of you is liquid, the bubbles collapse. But if we put soap, they stay, we reduce the tension on the walls, allows the alveoli to open, lungs get ready to breathe,