**Energy Balance**

Draw a picture of the system: example on slide 7

Overall mechanical energy balance: slide 9

ΔPk1->8 = ρ(μbar82 - μbar12)/2α

What is μbar8? =Q8/πR82

Μbar1 = Q1/πR12

Assuming that the liquid is Newtonian

Assume constant velocity (not parabolic profile)

What happens if we have steady state and R1 and R8 are the same?

If Q1 = Q8 = constant (steady state

R1 = R8

Μbar1 = μbar8 ==> ΔPk1->8 = 0

Slide 11:

μbar8 = 0

μbar4 = Q/πR42