Development of a Total Artificial Lung

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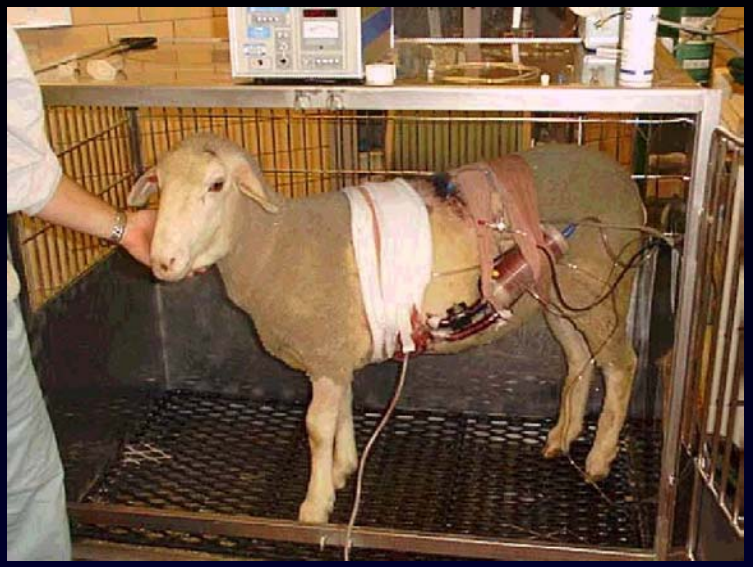
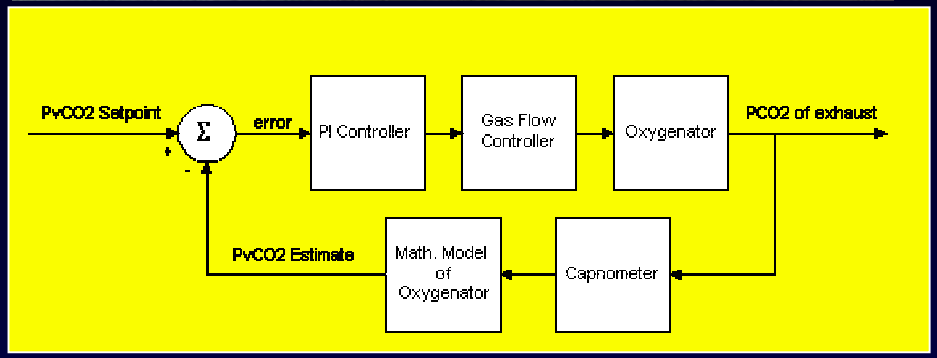
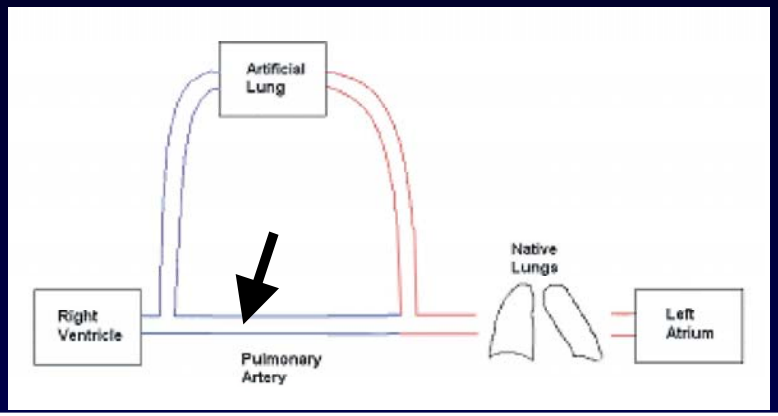
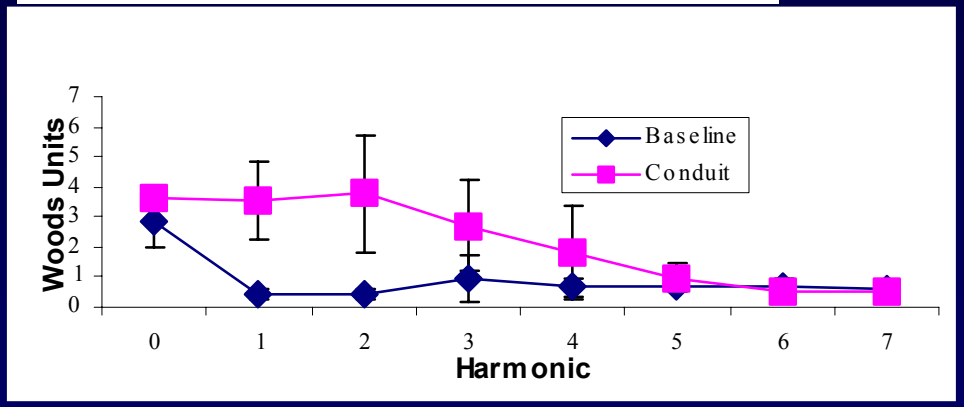
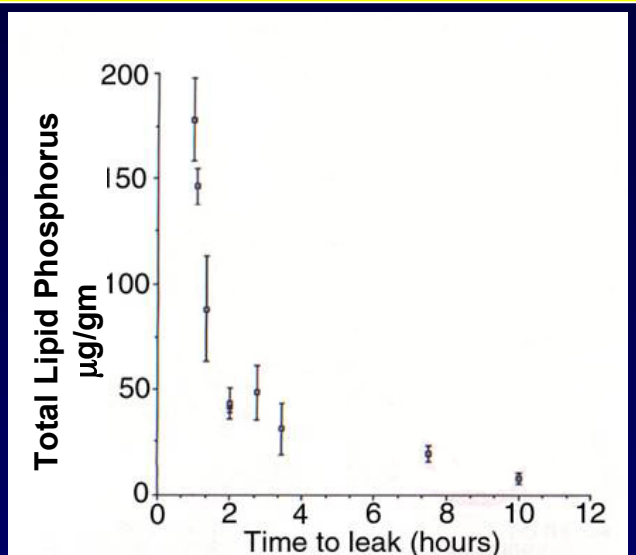
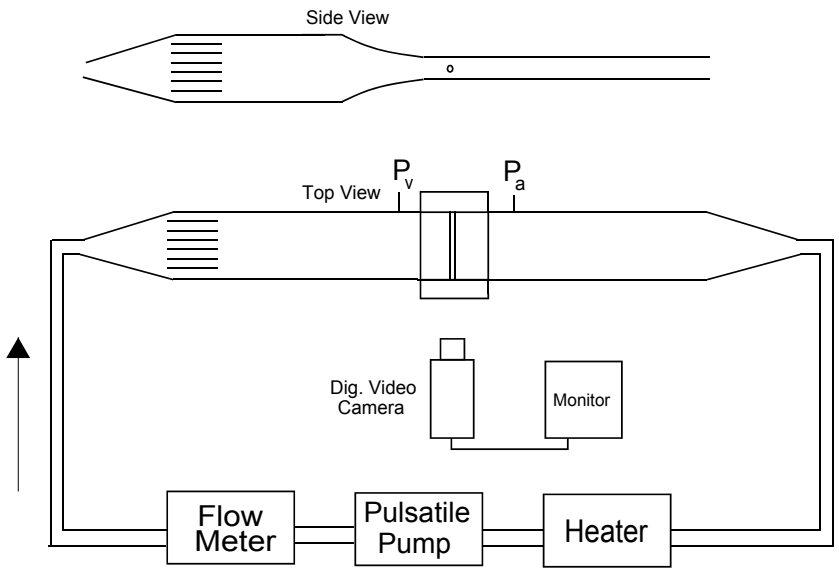


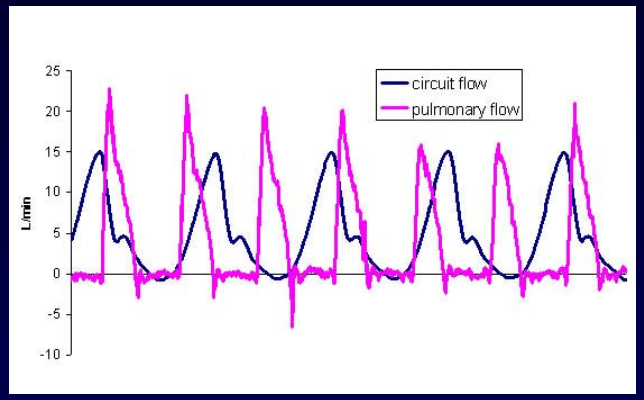

PvCO2 Setpoint
Σ
+
-
error
PI Controller
Gas Flow Controller
Oxygenator
PCO2 of exhaust
PvCO2 Estimate
Math. Model of Oxygenator
Capnometer


Artificial Lung
Right Ventricle
Pulmonary Artery
Native Lungs
Left Atrium


Woods Units
0
1
2
3
4
5
6
7
Baseline
Conduit
0
1
2
3
4
5
6
7
Harmonic


Total Lipid Phosphorus µg/gm
0
50
100
150
200
0
2
4
6
8
10
12
Time to leak (hours)


Side View
Top View
P_v
P_a
Dig. Video Camera
Monitor
Flow Meter
Pulsatile Pump
Heater


circuit flow
pulmonary flow
L/min
25
20
15
10
5
0
-5
-10