Phase 1:

- As workload increases, the body's energy (ATP) requirements are met through aerobic glycolysis
    - Glucose is turned into pyruvate producing 2 ATP and pyruvate
    - Pyruvate is oxidized in the cell mitochondria
    - Produces ~30 ATP and CO_2
- CO_2 production and O_2 consumption steadily increase

Aerobic Threshold :

- The body's energy needs grow faster than the body's ability to deliver oxygen to the muscles
    - Aerobic glycolysis alone no longer meets the body's ATP needs
- Glycolysis sharply increases,
    - Each reaction generating 2 ATP and pyruvate
    - Pyruvate can't oxidize (anaerobic), is turned into lactic acid
    - Acid is buffered by bicarbonate (HCO_3^-), creating excess CO_2
- This start of this extra CO_2 production can be seen in the inflection point in the CO_2 vs O_2 plot

Phase 2:

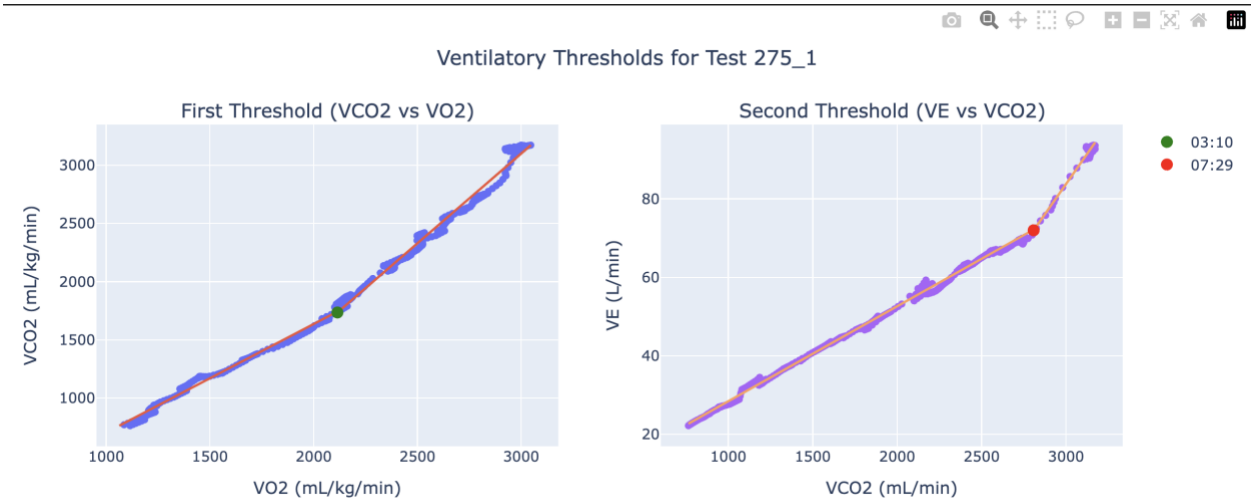
- The body is producing ATP both aerobically and anaerobically
- O_2 deliver in the body is still ramping up, but CO_2 levels are rising faster than they are in phase 1
    - Results in the two-line plot on CO_2 vs O_2

Anaerobic Threshold:

- The body's ability to buffer lactic acid is maximized
- Blood ph drops as the blood fills with H^+ ions
- Hyperventilation is triggered to blow off CO_2 and maintain blood ph
- Identified in the inflection point of VE (L/min) vs CO_2 production

Phase 3:

- VE rises faster relative to CO_2 than previously
- Low blood ph, buildup of metabolites interfere with muscle efficiency and ATP production
- Exhaustion reached


Ventilatory Thresholds for Test 275_1
First Threshold (VCO2 vs VO2)
VCO2 (mL/kg/min)
VO2 (mL/kg/min)
1000
1500
2000
2500
3000
Second Threshold (VE vs VCO2)
VE (L/min)
VCO2 (mL/min)
20
40
60
80
03:10
07:29