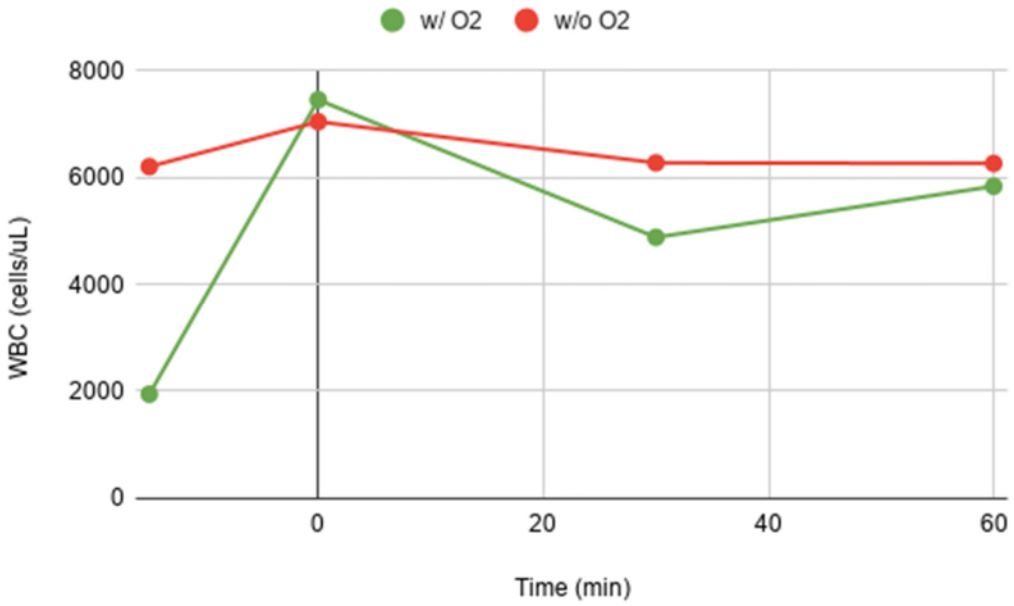
2020 0513 HyperMax MB+I+S+OS 52yoM – Effects of O2 on Exercise Performance

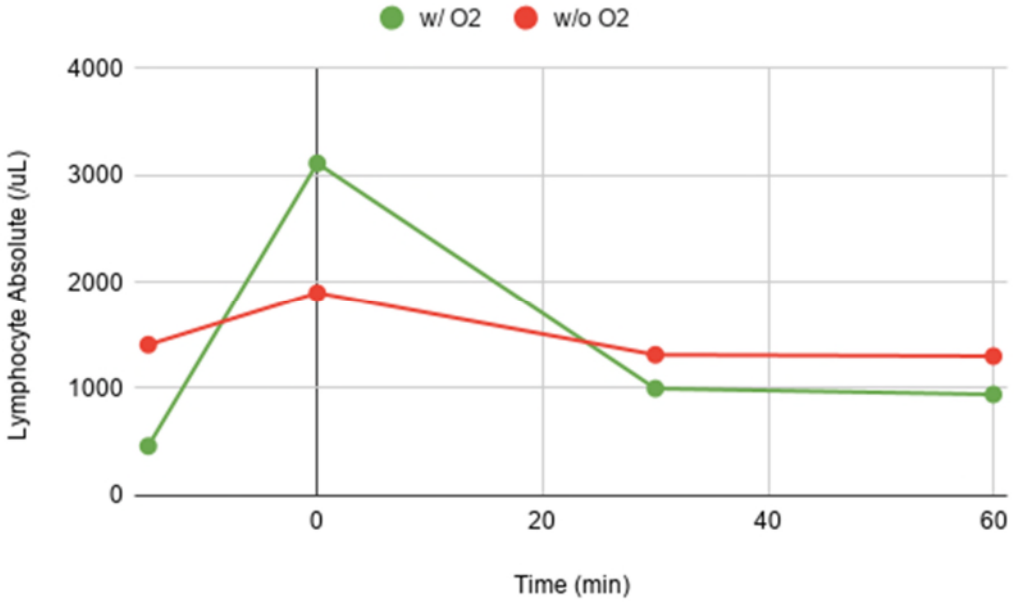
Marker	2020 0513 No O2 Elliptical Exercise				2020 0514 HyperMax Elliptical Exercise				Reference Range
	15:00 Pre	15:50 After	16:20 +30 min	16:50 +60 min	10:10 Pre	10:50 After	11:20 +30 min	11:50 +60 min	
DNA Viruses – Plasma	ND	ND	ND	ND	ND	ND	ND	ND	Not Detected
DNA Parasites – Plasma	ND	ND	ND	ND	ND	ND	ND	ND	Not Detected
DNA Fungi – Plasma	ND	ND	ND	ND	ND	ND	ND	ND	Not Detected
DNA Bacteria – Plasma	ND	ND	ND	ND	ND	ND	ND	ND	Not Detected
CD19, Absolute	288	243	275	263	85L	250	167	181	89 - 747 /uL
CD19, Percent	20.1H	12.7	20.3H	20.0H	18.4	7.5L	16.9	19.3H	9.0 - 19.0 %
CD3, Absolute	624	679	629	624	207L	767	494L	501L	606 - 3187 /uL
CD3, Percent	44.0L	35.6L	47.1L	47.7L	44.7L	23.8L	49.6L	53.2L	61.0 - 80.0 %
CD4, Absolute	477	512	476	491	157L	498	375	393	365 - 2087 /uL
CD4, Percent	33.9L	27.0L	36.2L	37.7	33.8L	16.0L	37.6	41.6	37.0 - 52.0 %
CD8, Absolute	136L	142L	120L	117L	53L	208	97L	93L	154 - 1264 /uL
CD8, Percent	9.7L	7.5L	9.1L	9.0L	11.5L	6.7L	9.7L	9.9L	15.0 - 32.0 %
CD16/56, Absolute	497	950H	398	390	161	2225H	304	236	26 - 497 /uL
CD16/56, Percent	34.8H	49.6H	29.3H	29.7H	34.7H	66.4H	30.6H	25.1H	3.0 - 12.0 %
CD4/CD8 Ratio	3.5H	3.6H	4.0H	4.2H	2.9	2.4	3.9H	4.2H	1.0 - 3.4 Ratio
WBC	6199	7038	6270	6259	1945	7448	4878	5832	4000 - 11000 Cells/uL
Lymphocyte, Absolute	1407	1896	1313	1300	463	3109	999	944	600 - 5500 Cells/uL
Lymphocyte, Percent	23	27	21	21	24	42	20	16	10 - 45 %
WBC	7.2	8.1	6.4	6.8	5.3	8.9	6.0	6.2	4.0 - 11.0 k/mm3
RBC	5.34	5.33	5.24	5.18	5.26	5.79	5.40	5.58	4.30 - 6.00 m/mm3
Hemoglobin	15.8	15.4	15.4	15.4	15.5	16.3	15.9	15.8	13.0 - 18.0 g/dL
Hematocrit	47.4	46.5	45.0	44.8	45.9	51.2	47.6	49.2	40.0 - 53.0 %
MCV	88.8	87.2	85.9	86.5	87.3	88.4	88.1	88.2	78.0 - 100.0 fL
MCH	29.6	28.9	29.4	29.7	29.5	28.2	29.4	28.3	27.0 - 34.0 pg
MCHC	33.3	33.1	34.2	34.4	33.8	31.8	33.4	32.1	31.0 - 37.0 g/dL
Platelet Count	165	170	155	160	155	197	156	170	130 - 450 k/mm3

RDW(sd)	44.3	44.1	42.0	42.9	43.7	43.5	43.8	44.9	38.0 - 49.0 fL
RDW(cv)	13.7	13.8	13.5	13.5	13.7	13.6	13.7	13.9	11.0 - 15.0 %
MPV	13.4	12.8	13.5	13.0	13.3	13.4	13.5	13.0	7.5 - 14.0 fL
Segmented Neutrophils	65.2	61.4	67.9	68.2	61.2	50.2	69.8	73.0	%
Lymphocytes	21.2	25.6	19.5	19.4	21.3	36.6	18.0	14.8	%
Monocytes	10.0	9.6	9.5	9.2	13.0	10.0	9.2	9.4	%
Eosinophils	2.2	2.1	2.2	2.2	3.4	2.1	2.0	1.9	%
Basophils	0.8	0.9	0.6	0.6	0.9	0.8	0.7	0.6	%
Absolute Neutrophil	4.67	5.01	4.36	4.61	3.24	4.46	4.20	4.52	1.60 - 9.30 k/uL
Absolute Lymphocyte	1.52	2.08	1.25	1.31	1.13	3.25	1.08	0.92	0.60 - 5.50 k/uL
Absolute Monocyte	0.72	0.78	0.61	0.62	0.69	0.89	0.55	0.58	0.10 - 1.60 k/uL
Absolute Eosinophil	0.16	0.17	0.14	0.15	0.18	0.19	0.12	0.12	0.00 - 0.70 k/uL
Absolute Basophil	0.06	0.07	0.04	0.04	0.05	0.07	0.04	0.04	0.00 - 0.20 k/uL
Immature Granulocytes	0.6	0.4	0.3	0.4	0.2	0.3	0.3	0.3	%
Abs Imm Granulocytes	0.04	0.03	0.02	0.04	0.01	0.03	0.02	0.02	0.00 - 0.10 k/uL
NRBC RE, Nucleated RBC Perc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 1.0 %
Glucose	105H	99	97	94	112H	131H	118H	103H	65 - 99 mg/dL
Urea Nitrogen (BUN)	16	15	15	15	12	13	13	13	8 - 25 mg/dL
Creatinine	1.01	1.08	1.05	1.04	0.96	1.11	0.99	1.05	0.60 - 1.50 mg/dL
GFR Estimated	85	78	81	82	90	76	87	81	>=60 mL/min/1.73m2
BUN/Creatinine Ratio	15.8	13.9	14.3	14.4	12.5	11.7	13.1	12.4	10.0 - 28.0
Uric Acid	5.4	5.6	5.6	5.5	5.0	5.4	5.8	5.5	3.5 - 8.0 mg/dL
Sodium	140	138	140	142	139	141	139	140	134 - 147 mmol/L
Potassium	4.3	4.2	4.2	4.5	4.2	4.4	4.5	5.0	3.6 - 5.3 mmol/L
Chloride	103	102	104	104	104	103	103	104	95 - 108 mmol/L
Carbon Dioxide (CO2)	23	21	26	24	23	18L	23	26	19 - 31 mmol/L
Anion Gap	14	15	11	14	12	21H	13	10	4 – 18
Osmolality, Calculated	287	282	286	290	284	289	285	287	275 - 295 mOsm/kg
Protein, Total	7.2	7.1	7.1	7.0	6.8	7.5	7.2	7.0	6.0 - 8.0 g/dL
Albumin	4.8	4.6	4.6	4.7	4.5	5.0H	4.9	4.8	3.6 - 5.1 g/dL
Globulin	2.4	2.5	2.5	2.3	2.3	2.6	2.3	2.2	1.9 - 3.7 g/dL
Albumin/Globulin Ratio	2.0	1.8	1.8	2.1	1.9	1.9	2.1	2.2	1.0 - 2.5
Cholesterol	232	243	235	227H	238H	267H	262H	249H	<=199 mg/dL

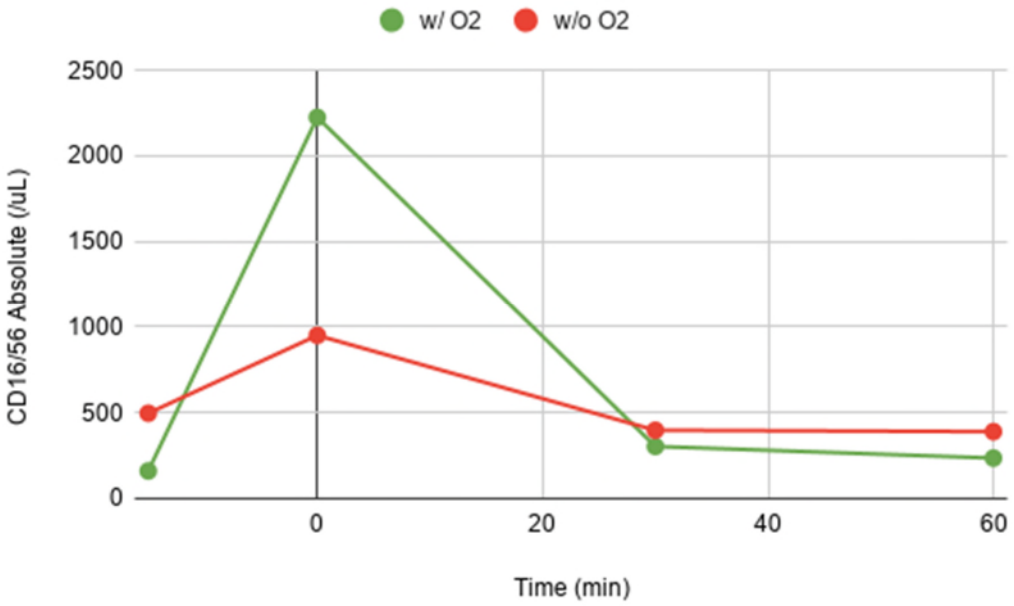
Triglyceride	71	88	62	60	66	102	71	66	<=149 mg/dL
Calcium	8.9	9.1	8.9	9.0	9.6	9.9	9.8	9.7	8.7 - 10.4 mg/dL
Phosphorus (Inorganic)	3.4	3.7	3.0	3.0	2.9	4.4	3.2	2.7	2.4 - 4.8 mg/dL
Alkaline Phosphatase	43	46	43	43	40	51	46	44	40 - 140 IU/L
GGT	13	14	13	13	13	15	14	14	5 - 80 IU/L
Alanine Aminotransferase	31	29	31	29	31	30	31	31	5 - 60 IU/L
Aspartate Aminotransferase	30	33	33	32	32	38	35	35	10 - 50 IU/L
Lactate Dehydrogenase	78L	99L	84L	84L	80L	102L	90L	88L	112 - 245 IU/L
Bilirubin, Total	0.9	1.0	1.1	1.1	0.9	1.1	1.1	1.1	0.2 - 1.3 mg/dL
Cholesterol/HDL Ratio	4.2	4.3	4.3	4.0	4.2	4.3	4.4	4.4	<=4.9
HDL Cholesterol	55	56	55	56	57	62	59	57	>=40 mg/dL
Non-HDL Cholesterol	177	187H	180H	171H	181H	205H	203H	192H	<=129 mg/dL
LDL Cholesterol, Calculated	162 H	169H	168H	159H	168H	184H	189H	179H	<=99 mg/dL
VLDL Cholesterol	14	18	12	12	13	20	14	13	<=29 mg/dL
d-ROMs https://www.hedsrl.it/eng/oxidative-stress/what-is-d-roms-test/ Unit of measure: U. Carr 1 U. Carr = 0.08 mg H^2O^2/dL	668	384	403	461	408	365	269	561	250-300 Optimal 300-320 BL 321-340 Low 341-400 Med 401-500 High > 500 Very high
PAT https://www.hedsrl.it/eng/oxidative-stress/what-is-the-pat-test/ Unit of measure: U. Cor 1 U.Cor = 1.4 µMol/L of ascorbic acid	2496	2487	2430	1728	1877	2816	2226	2321	<2800 Very high 2200–2800 Nor 2200–2000 BL 2000–1800 Slightly def < 1800 Deficient
OBRI https://www.hedsrl.it/eng/obri/ Oxidative Balance Risk Index The cardiovascular risk index	2.4	1.4	1.5	2.4	1.9	1.1	1.0	2.1	0.8-1.2 Normal 1.3-1.7 Borderline 1.8-2.2 High >2.2 Very High
OSI Redox https://www.hedsrl.it/eng/osi/ Oxidative Stress Index Summary value of oxid stress	224	62	74	124	92	51	27	164	<40 Normal 41-65 Borderline 66-120 High >121 Very High



Higher peak of WBC with O2



Higher peak of lymphocytes with O2



Higher peak of NK cells with O2

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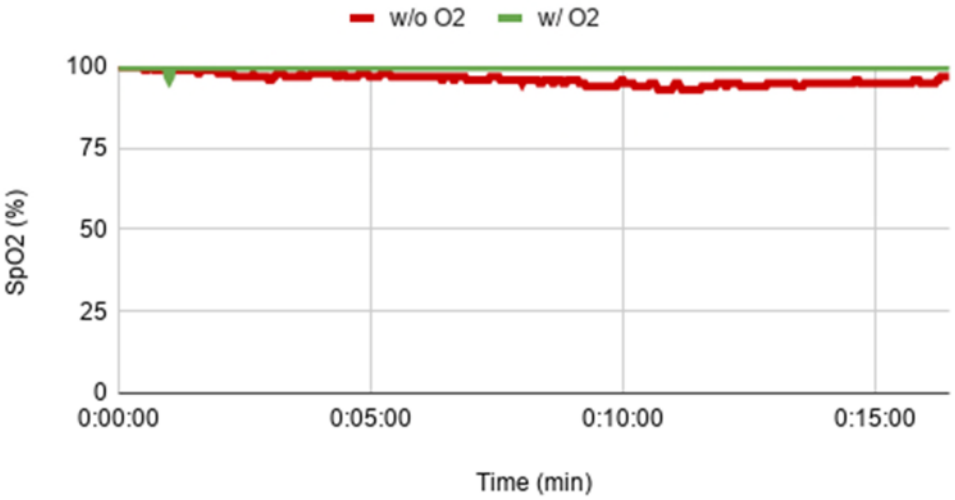

O2 saturation at 100% with O2

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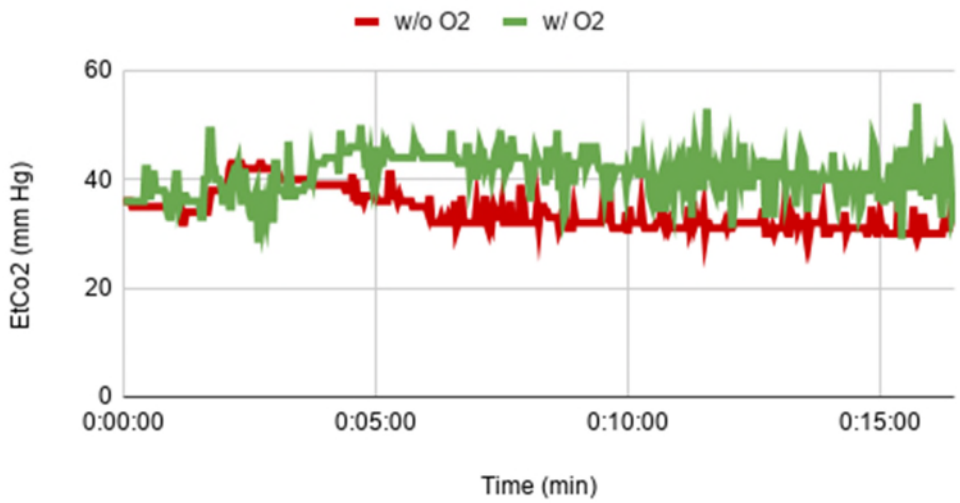
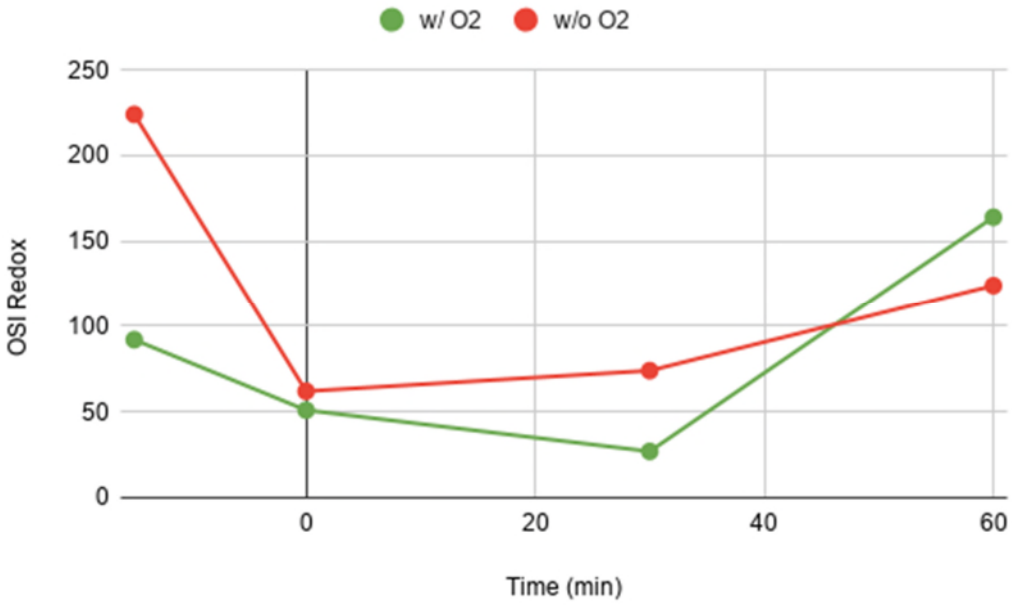


EtCO2 higher with O2



Oxidative stress lower with O2

Subject background:

- 52 year old male
- Advanced osteoarthritis

Exercise Protocol

- On 2020 0513
  - First blood draw at 15:00, before exercise, called Pre
  - Performed 20 min of elliptical exercise while breathing through mask and not connected to O2 bag
  - Second blood draw at 15:50, after exercise, called After
  - Third blood draw at 16:20, 30 minutes after exercise, called +30 min
  - Fourth blood draw at 16:50, 60 minutes after exercise, called +60 min
- 2020 0514
  - First blood draw at 10:10, before exercise, called Pre
  - Performed 20 min of elliptical exercise while breathing through mask and connected to O2 bag
  - Second blood draw at 10:50, after exercise, called After
  - Third blood draw at 11:20, 30 minutes after exercise, called +30 min
  - Fourth blood draw at 11:50, 60 minutes after exercise, called +60 min

Results:

- If you compare elliptical exercise with room air O2 vs elliptical exercise with HyperMax O2:
  - HyperMax O2 significantly increases WBCs, lymphocytes, NK cells, RBCs, hemoglobin and hematocrit
  - This individual had done about several sessions prior to this data and notice no organisms were found in his blood! He is the only person to date. Also note he has the highest NK Cells we have ever measured 2225H (4th column from right)
- No negative effects of HyperMax on liver or kidney function markers, indicating this is safe
- This individual has since increased joint range of motion and no longer needs any pain medications (no Celebrex, Ibuprofen, Tylenol, Advil, Alleve, etc)
- He is now lifting 150 pound dumbbells easily without needing to warm up

- Reviewing this data with respect to:
  - Immunity Boosting – data shows increase in immune parameters
  - Disease and Virus fighting/preventative – indirect evidence – only person to date no plasma organisms detected
  - Lung Health – no evidence, cannot measure adequately using Massimo
    - See https://www.cosmed.com/en/products/cardio-pulmonary-exercise-test/quark-rmr
    - https://www.cosmed.com/en/products/pulmonary-function/q-box
  - Youthfulness qualities – subjective evidence based on subject responses
    - Could be improved if we had questionnaire

        - https://link.springer.com/article/10.1023/A:1009524612420
        - https://www.tandfonline.com/doi/abs/10.1080/15298868.2015.1133452?src=recsys&journalCode=psai20
        - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7397859/
    - Weight Loss – no evidence
        - We have tools to measure
        - This needs to be considered as a 3-6 month project
    - Reduction of Depression and Brain Fog – subjective evidence based on subject responses
        - Could be improved if we had questionnaire
        - Go here https://www.mdcalc.com/ type in ‘depression’
    - Joint Pain Relief – subjective evidence based on subject responses
        - Could be improved if we had questionnaire
        - Go here https://www.mdcalc.com/ type in ‘joint pain’
    - Cardiovascular Health – subjective evidence based on subject responses
        - Could be improved if we had EEG or other physiological data
    - Better overall Fitness – subjective evidence based on subject responses
        - Cannot measure adequately using Massimo
        - See https://www.cosmed.com/en/products/stress-testing-ecg
        - https://www.cosmed.com/en/products/ergometers/cosmed-treadmills
        - https://www.cosmed.com/en/products/ergometers/cosmed-bikes