How to Become Eligible for NXN Without a Single VO2Max Workout and Lessons from the Starting Line

Rod Murrow, JD
St. James Academy/MileSplit
Lenexa, Kansas
rodney.murrow@gmail.com
(913)523-6570

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2017 NXR HEARTLAND TEAM RESULTS

5,000 Meters Championship - Women

1 Wayzata XC Club (65)
2 Edina XC (119)
3 Washburn Running Club (186)
4 Thunder XC Club (218)
5 Sun Prairie XC (229)
6 Winged Foot Running Club (252)
7 Farmington Tigers Cross country Club (255)
8 Johnston Dragoons (261)
9 Wildcat XC (278)
10 Minnetonka Running Club (279)
11 Spartan XC (279)
12 Knights XC (343)
13 Sty-U Cross Country Club (373)
14 Fargo Davies (414)
15 Shawnee Mission NXC (438)

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INDIVIDUAL RESULTS

25	Murrow, Sarah	18:07.25
49	Moore, Katie	18:26.59
55	O'Connor, Mary	18:30.21
91	Goetz, Mary	18:53.31
94	Robinson, Hannah	18:57.87

AVERAGE 18:35.05

- Highest-ever NXR finish by Kansas girls team
- Only Kansas girls team to ever have more than three run sub-19:00 in same season
- Fastest average ever by Kansas girls team

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September 11 - September 17, 2017 2017 KSHSAA Season: Week 5, Macro-Cycle: Week 16, Micro-Cycle #3 Week 5

M=Mile(s) WU=Warm Up CD=Cool Down LR=Long Run BF=Barefoot CV=Critical Velocity Pace TM=Thunder Mountain EZ=Easy Pace

	MONDAY	TUESDAY	WEDNESDAY Lake Lenexa	THURSDAY	FRIDAY Morning Mass	SATURDAY Race Day	SUNDAY	Weekly Mileage	NOTES
Advanced	Core, 11M LR; 8 x BF strides (11.5) Bands, Ropes College Blvd +	Core, 7 EZ; 8 x BF strides (7.5) Bands, Ropes 2 x new trail +	1M WU; 8 x 800 @ CV w/2:00 recovery; 6 x TM 2M CD (7.5)	Core, 7M EZ (7) Bands, Ropes Past Shallow Lake	5M EZ (5) Toward Honeywell	2M WU; 5k race; 2M CD (7)	7M EZ Core	52.5	
Intermediate Varsity	Core, 9M LR; 8 x BF strides (9.5) Bands, Ropes College Blvd +	Core, 6 EZ; 8 x BF strides, Bands, Ropes (6.5) 2 x new trail	1M WU; 6-7 x 800 @ CV w/2:00 recovery; 6 x TM 2M CD (7.5)	Core, 6M EZ (6) Bands, Ropes Past Shallow Lake	4.5M EZ (4.5) Toward Honeywell	2M WU; 5k race; 2M CD (7)	5M EZ (5) Core	46	
Intermediate JV	Core, 7M LR; 7 x BF strides (7.5) Bands, Ropes Toward Honeywell	Core, 5 EZ; 8 x BF strides, Bands, Ropes (5.5) 1.5 times new trail	1M WU; 5-6 x 800 @ CV w/2:00 recovery; 6 x TM 1M CD (6.5)	Core, 5M EZ (5) Bands, Ropes Past Shallow Lake	5M EZ (5) Overpass	2M WU; 5k race; 2M CD (7)	3M EZ (3) Core	37.5	
Level 2	Core, 5M LR; 8 x BF strides (8.5) Bands, Ropes Toward Honeywell	Core, 3 EZ; 8 x BF strides, Bands, Ropes (3.5) 1 x new trail	1M WU; 4-5 x 800 @ CV w/2:00 recovery; 6 x TM 1M CD (5)	Core, 3M EZ (3) Bands, Ropes Overpass	5M EZ (3) Overpass	1M WU; 5k race; 2M CD (6)	3M EZ (3) Core	29	
Level 1	Core, 4M LR; 8 x BF strides (5.5) Bands, Ropes Toward Honeywell	Core, 3 EZ; 8 x BF strides, Bands, Ropes (3.5) 1 x new trail	1M WU; 3 x 800 @ CV w/2:00 recovery; 6 x TM 1M CD (4)	Core, 2M EZ (2) Bands, Ropes Pond	5M EZ (2) Pond	1M WU; 5k race; 1M CD (5)	2M EZ (2) Core	20	

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CAR MODEL – ENGINE & TRANSMISSION

ENGINE – Provides the Energy/Power

Energy and metabolic systems; cardiovascular and cardiopulmonary systems; muscular capillarization; cellular mitochondria, max lactate tolerance

Examples: aerobic running, lactate threshold, critical velocity (CV), aerobic threshold, vVO2 max and faster

TRANSMISSION – Converts Energy/Power to Motion

Biomechanical and neuromuscular systems; muscle fiber types (I, IIa, IIx), running economy

Examples: form work, drills, sprint training, supplemental strength/PT, range of motion, flexibility, barefoot running, posture

NEED BOTH – CAN'T PUT A FERRARI ENGINE IN A PRIUS

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WHAT IS VO2 MAX?

Clinical Definition

Maximum volume of oxygen used in one minute per kilogram of body weight.

How vVO2 Max is Determined

Scientifically: 7:00 all-out effort or treadmill measurement with special equipment

Practically: Slightly faster than 2M race pace

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VO2 MAX VERSUS LACTATE THRESHOLD

Lactate Threshold

The effort at which the athlete begins to accumulate lactate faster than they can clear it.

Lactate threshold is the single most important factor in distance.

It is *after* the lactate threshold is crossed that lactate tolerance work comes into play becomes relevant.

Lactate threshold is approximately 80%-85% correlated to 5K race performance, but VO2 max is only about 16% correlated to 5K race performance.

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TWO WAYS TO INCREASE LACTATE THRESHOLD

Push It Up

Higher volume of slightly slower paced work

Pull It Up

Lower Volume of faster paced work

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MITOCHONDRIAL DEVELOPMENT

Mitochondria

Aerobic "Powerhouse" of the cell

Mitochondrial Development by Muscle Fiber Type and Training

I – Lower intensity aerobic running

IIa – Threshold, critical velocity, tempo

IIx – very fast, high intensity @400m-800m race pace

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Training Paces Table								
By Thomas M Schwartz, Ph.D., 12/06/2020								
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5000m		3200m		VO2max				
Time	(per Mile)	Time	(per 1600m)	(per Mile)	(per 1000m)	(per 800m)	(per 600m)	(per 400m)
15:00	4:49.68	9:21.29	4:40.64	4:37.1	2:52.2	2:17.7	1:43.3	1:08.9
16:00	5:08.99	9:58.71	4:59.35	4:54.4	3:02.9	2:26.3	1:49.8	1:13.2
17:00	5:28.31	10:36.13	5:18.06	5:11.7	3:13.7	2:34.9	1:56.2	1:17.5
18:00	5:47.62	11:13.55	5:36.77	5:28.9	3:24.4	2:43.5	2:02.6	1:21.8
19:00	6:06.93	11:50.97	5:55.48	5:46.1	3:35.1	2:52.1	2:09.0	1:26.0
20:00	6:26.24	12:28.38	6:14.19	6:03.2	3:45.7	3:00.6	2:15.4	1:30.3
21:00	6:45.55	13:05.80	6:32.90	6:20.3	3:56.3	3:09.1	2:21.8	1:34.5
22:00	7:04.87	13:43.22	6:51.61	6:37.3	4:06.9	3:17.5	2:28.1	1:38.8

5000m	3200m	Critical Velocity					Threshold	Aerobic Tempo
Time		(per Mile)	(per 1600m)	(per 1200m)	(per 1000m)	(per 800m)	(per mile)	(per mile)
15:00	9:21.29	5:03.2	5:01.4	3:46.1	3:08.4	2:30.7	5:17.4	5:33.1
16:00	9:58.71	5:22.2	5:20.3	4:00.2	3:20.2	2:40.1	5:37.3	5:54.0
17:00	10:36.13	5:41.1	5:39.1	4:14.3	3:31.9	2:49.6	5:57.1	6:14.8
18:00	11:13.55	6:00.0	5:57.9	4:28.4	3:43.7	2:58.9	6:16.8	6:35.5
19:00	11:50.97	6:18.7	6:16.5	4:42.4	3:55.3	3:08.3	6:36.5	6:56.2
20:00	12:28.38	6:37.5	6:35.2	4:56.4	4:07.0	3:17.6	6:56.1	7:16.8
21:00	13:05.80	6:56.2	6:53.8	5:10.3	4:18.6	3:26.9	7:15.6	7:37.3
22:00	13:43.22	7:14.8	7:12.3	5:24.2	4:30.2	3:36.1	7:35.1	7:57.8

5000m	3200m	Slow Tempo	Moderate Pace	EZ-Mod. Pace	Easy Pace	Very Easy Pace
Time		(per Mile)	(per Mile)	(per Mile)	(per Mile)	(per Mile)
15:00	9:21.29	5:50.8	6:10.7	6:28.6	6:48.5	7:10.9
16:00	9:58.71	6:12.8	6:33.9	6:52.9	7:14.1	7:37.9
17:00	10:36.13	6:34.7	6:57.0	7:17.1	7:39.6	8:04.8
18:00	11:13.55	6:56.5	7:20.1	7:41.3	8:05.0	8:31.6
19:00	11:50.97	7:18.2	7:43.1	8:05.4	8:30.3	8:58.3
20:00	12:28.38	7:39.9	8:06.0	8:29.4	8:55.6	9:24.9
21:00	13:05.80	8:01.5	8:28.8	8:53.4	9:20.7	9:51.5
22:00	13:43.22	8:23.1	8:51.6	9:17.3	9:45.8	10:17.9

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TRACK TO GRASS CONVERSION

Track to grass conversion = 3% for level, straight, smooth, short grass.

Allow more for hills, rough footing, taller grass, sharp turns, etc.

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Sprinting: 1.5 Miles (1 Mile Recruitment) **CV Pace:** 4 Miles **Long Run:** 11 Miles

Race: 3.1 Miles **Aerobic:** 33 Miles (14 Miles recovery, 19 Miles threshold)

LATHER, RINSE, AND REPEAT

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LIGHTING THE WAY FROM BEHIND

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LYDIARD, SNELL, HALBERG, THE BEACH & THE TEACHABLE MOMENT

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25 DAYS

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INVALUABLE…AND IRRELEVANT

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THE BEST TEAMMATES IN THE WORLD

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