

Aerobic Development in Collegiate Ice Hockey

Here at UMass Lowell, we currently implement a 4-day off-season training program. We take a comprehensive approach to performance training, with an emphasis on teaching movement and developing functional strength. We look at Energy System Development as more than just “gut check” high intensity sessions, but rather a continuum where the alactic, lactic, and aerobic systems all need development in varying amounts, and at different times throughout the year.

Our early off-season phases with hockey are built around reconditioning the athlete from the rigors of the long in-season. This means we place an emphasis on teaching movement mechanics, improving fundamental athletic requirements such as the ability to land properly, develop stability/motor control, and improve posture and mobility. We also focus our Energy System Development on improving Cardiac Output, so that we are less reliant on the lactic system for our energy demands and also to improve our recovery ability. However, we do almost no steady state type work. We develop these low-end aerobic adaptations within the context of our training system, which incorporates movement training, weight lifting, and interval based conditioning work.

PRE LIFT

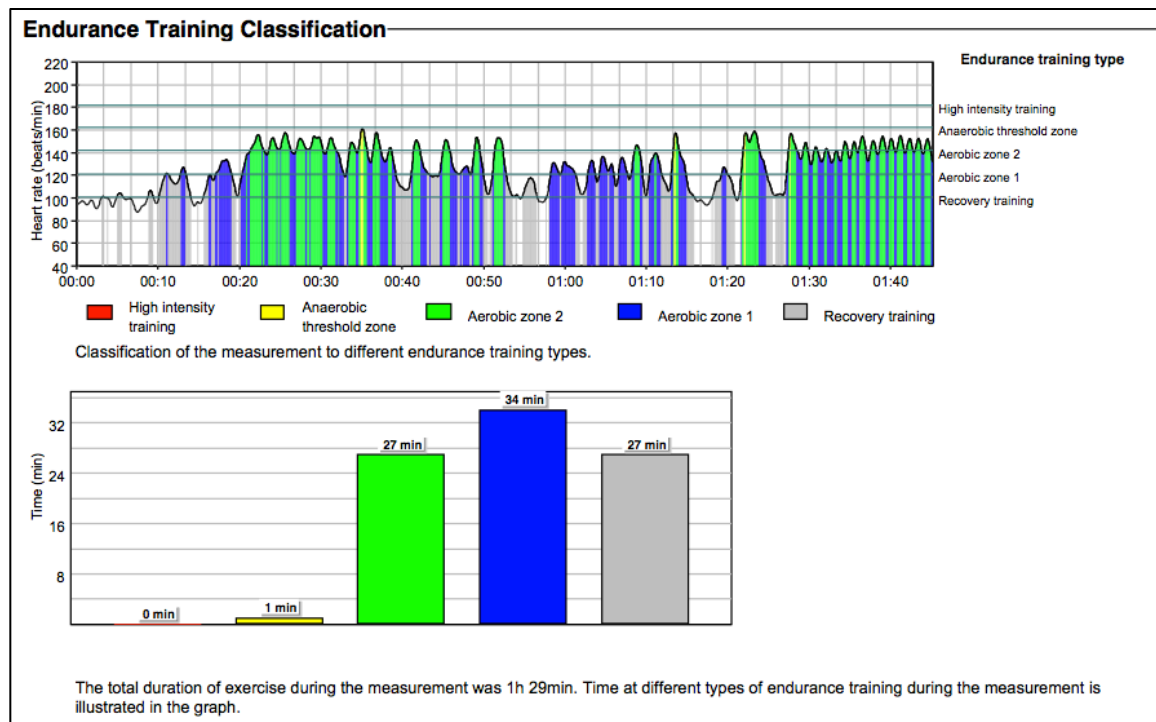
DAY 4 Thursday Phase 2											
PREP				Movement Development				Explosive Power			
Breathing/ Positional	90/90 Wall Bridge with Right Arm Reach- Use roller or ball to squeeze	2x4x:6 Breaths		Movement Prep	1. Inch Worm w/ Push Up	7. A Skip Backward	Power	2 Leg Hurdle Jump- Stick	3x5	Quad Set	
					2. Knee Cradle/Ft Grab and Lean	8. High Knee Run					
Foam Roll	Glutes, Hamstrings, Low Back, Upper Back, Lats, Hip Flexors, Quads, Adductors	x5 each			3. SLDL	9. Butt Kick		Standing Stable Chest Pass	3x8		
					4. St. Leg March			Standing Stable Floor Slam	3x8		
AIS Bench Stretch	Hamstrings, Hip Flexors, Glutes, Adductors, Pec Minor	x:2x5 each			5. St. Leg Skip		Resisted Movement	Sled March	x6		
					6. A Skip Fwd						
Mobility/ Activation	Ankle Roll and 2 Way	x5 each		Movement	Wall Single, Wall Triple	x2 each	Lift (see other sheet)				
					Lean Fall Run with Band Leg Lower	x6 sprints	Energy System Development	Tempo Run	7/8/9/10 Laps		
	Toe Touch Squat w/ Rotation	x6				Forward/Backpedal/Walk		:20/:40			
	Cook Hip Lift- with tennis ball	2x5 Breath Cycles				x2 lowers each rep					
Only you decide your level of commitment.											

To achieve the dual goals of addressing Cardiac Output as well as beginning our Movement/Strength/Power development program, we utilize our Heart Rate system to ensure we are working at the proper intensities during our Movement and Energy System Development portions of the training sessions. We are able to post the real-time heart rate response of our athletes on a TV in the weight room. During our Pre-Lift work I simply ask the players to rest between a circuit of

I also think we are getting some aerobic adaptations during our lift, however I am not consciously programming our strength and power work to develop this. When we review the HR data post training, we clearly see large percentages of time spent in the coveted 120-150bpm realm, which is the proper stimulus for central cardiac adaptations. While the initial spikes in HR during the lift are as a result of the strength exercise itself (hang clean, for instance) and possibly not the right “type” of stimulus to elicit cardiovascular change, I think that our stretch/mobility/core work that constitutes tri and quad sets is keeping our HR in the right area, and as a result helping us with Cardiac Output.

[illegible]

The following charts are from one of the reports off our FirstBeat Heart Rate System. The “Endurance Training Classification” is the tracking of a player’s heart rate over the course of a training session. The “Pre Lift” takes the player up to about the 38min mark, while the “Lift” goes from that point up to about 1:25. The last chunk, from about 1:28 until the end of the graph is the “Energy System” portion. The colors constitute a percentage of HRmax. Blue= 60-69%, Green= 70-79%, Yellow= 80-89%, and Red= 90-100%. Clearly you can see that this individual spent almost all of his time between 60-80% of HRmax. The chart below that gives you the actual minutes spent at each zone. This player spent a combined 61min between 60-80%. At a HRmax of 204, that means he ranged from 122-163 for an hour.



In my mind, we are clearly getting the aerobic adaptations we are seeking by simply manipulating and being aware of the work: rest ratios of our normal training. If we need to develop other energy systems at different points in the year, we simply adjust accordingly. For example, later in the off-season we may utilize the exact same “Pre Lift” training, but change the work: rest ratios to emphasize a different adaptation. The circuit of Plyo, Medball, Sled, Medball might be the same, but I will increase the duration of the exercise to drive a higher HR response, and then have the athletes move onto the next exercise at a higher HR (giving them less rest) to develop more lactic capacity.

Hopefully this gives some insight into how we address Energy System adaptations within our system and will spur some conversation. There have been a lot of discussions recently on how to best develop these systems, and how to achieve aerobic adaptations in the team setting. In my experience, an understanding of the underlying physiology you need to achieve and a little creativity can go a long way.

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