

In-Season Ice Hockey Training: Is Maintenance Enough? **Anthony Donskov, MS, CSCS, PES**

In today's competitive world of athletics much has been written and debated on the topic of off-season strength and conditioning. Although this is an extremely important aspect of athletic development, it serves as only one piece of the pie with regards to overall development of the athlete. The picture may be painted clearer when we look at the schedule of an elite hockey player. The National Hockey League/Major Junior schedule begins (not including pre-season) in October and ends in early April. This, at minimum, is seven months spent of the entire training year in-season. College Hockey also begins in October and ends in early February, but has more time devoted to athletic development with less time spent playing games. The fact still remains: there is a considerable amount of time spent during the "in-season" training period! Lets look at the breakdown of time allotment for an elite athlete.

Off-Season: 2-4 months (17%-33% of the training year)

******Note:** the off-season is longer for college hockey players and all other athletes who fail to make the playoffs.

Pre-Season: 1 month (8% of training year)

In-Season (excluding playoffs): 5-9 months (42%-58+% of entire training year)

With the numbers and percentages listed above, why do so many coaches today refer to the in-season as a "maintenance" period? How are we supposed to develop strong, injury free athletes if we focus our efforts on "maintenance" for nine months? The answer, in my opinion, is we don't!

Maintenance: "The process of maintaining or preserving someone or something, or the state of being maintained."

I must admit (embarrassingly enough) that a few years ago I referred to the in-season as "maintenance" to our off-season strength gains. My thought process was that if we could keep/maintain our strength gains throughout the year, we would be in good shape leading into the next off-season when the schedule did not revolve around hockey. Keeping our strength gains meant using sub-maximal loads while rarely tapping into high intensity (% of 1RM variability) exercise. Looking back at my decision, I believe that I hindered my athletes' development! My protocol looked like one big strength endurance block spread over the entire season (I know....bad!!). My athletes weren't growing, they were not getting stronger: their bodies had adapted to the stimulus, and I was doing a shitty job providing the CNS stress they needed to enhance their performance for fear of on ice fatigue.

It wasn't until I had the opportunity to fly to Boston for coach Boyle's mentorship program that my opinion changed. I asked coach Boyle about his in-season hockey

“maintenance” program and he chuckled. I found out why he was chuckling a few hours later when I had the opportunity to watch the BU hockey team in action. The weight room was intense, music blaring, attention to detail and the protocol was demanding with athletes pushing themselves and each other. Coach Boyle also recommended that I read a Charles Poliquin article: *Variety In Strength Training* (currently posted on the strengthcoach.com web-site).

Poliquin states: “ **Variety is a critical factor in optimizing the strength training response, as it helps avoiding physiological and psychological stagnation caused by over-emphasized specialization.**” He goes on to explain the many ways to skin a cat. Variables such as manipulating the training loads, varying the type of contraction, varying the speed of contraction and varying the exercise can all provide adequate growth stimulus to the athlete while avoiding psychological boredom/physical exhaustion. I know this sounds basic, but it amazes me today that many coaches don’t truly have a good understanding of how, when, and why to manipulate these variables.

This led me to read several other books by Christian Thibadeau: *The Little Black Book of Training Secrets*, and *High Threshold Muscle Building* that solidify these views and offer further advice on how these variables can provide solid strength gains (yes, even during the competitive season). Below is the information/variables that I currently manipulate with my athletes today. As I continue to learn and grow as a strength coach, these variables will continue to multiply. I no longer view the in-season, as a “maintenance” block. I want my athletes, bigger, stronger, faster, and injury free...and I have 5-9 months to do it!

*****Please note these variables may change due to the demand of the regular season game schedule.**

Adequate Recovery: On-ice work coupled with off-ice strength and conditioning act as a stimulus to enhance growth. Rest, relaxation and recovery serve to cement growth/adaptation. In other words, if we don’t allow adequate recovery, our strength gains may be compromised and our athletes over trained. This is especially important during the season, where the schedule is demanding. In a perfect world, I recommend that players train immediately after practice and games. I would prefer that they use off days as adaptation/growth days. Many authorities suggest 24-48 hours of recovery before the next training session, but many times the schedule doesn’t allow for this. Again variables such as exercise selection, load, and volume can all be manipulated to allow the athlete to complete multiple training sessions during the week.

Frequency: The game of hockey is organized chaos. Players are constantly pushing their bodies to the max, taxing the musculoskeletal/anaerobic energy system each and every shift. At the professional level (NHL) the schedule calls for an 82 game regular season, and at the Division 1 College Hockey level 36 games during the regular season (our minor hockey U18 AAA Blue Jackets play a 62 game schedule). This is demanding! There is a fine line between the stress applied, adaptation and

exhaustion (REMEMBER: the demands of the game serve as a stress to the body as well). It is our job as coaches to maintain adequate stress, promote adaptation, all while steering clear of exhaustion and overtraining. Depending on number of games, I recommend a frequency of 2-3 lifts/week during the season. These lifts are intense and provide adequate stress to promote muscle growth and strength gains. As a general rule, I want my athletes to train a minimum of 2/week during the season.

Intensity/Volume: Intensity refers to the load used comparative to what one would use at their best. Volume is the total amount of weight lifted in a workout, or group of workouts. It can be calculated by multiplying repetitions and weight (repetitions x weight= volume). Intensity and volume are inversely related. As intensity (% 1RM) increases, the number of repetitions per set decreases. During the competitive season both of these variables must be monitored. During a high intensity lift, %1RM is increased to promote intra muscular tension (effort of muscles to produce a certain force output). This tension is influenced by the intensity of the load, and the acceleration of the load ($F=ma$). Higher intensity is superior at developing and maintaining neuromuscular efficiency while taxing the bodies high threshold motor units. There are also phases of higher volume and eccentric work to enhance time under tension (TUT). We may use periods of higher volume to build hypertrophy, or to work on strength endurance during certain portions of the seasons.

Exercise/Conditioning Selection: Coach Mark Ripptoe explains: “ It is necessary, though, that exercises adequately prepare the neuromuscular system for the range of motion, power requirements, strength requirements, and endurance requirements of the sport.” Most effective sports performance programs, in my opinion, will include the clean, snatch, front squat (may soon be replaced with the RFESS), rear foot elevated split squat, single leg squat and trap bar dead lift. I believe that many of these bi-lateral exercises may soon be replaced with uni-lateral protocol. An extremely high percentage of sports are uni-lateral in nature. Rarely, if ever, is weight evenly supported during movement in sport. Uni-lateral training changes everything and taxes the bodies lateral sub-system (gluteus medius, adductor complex, TFL and quadratus lumborum), bi-lateral work does not. Furthermore, research is showing that uni-lateral work may be superior in recruiting high-threshold (fast twitch) motor units. This is good news for athletes looking to become stronger and faster!

Undulating Periodization: This method of periodization adjusts the set, reps, tempo and intensity during the course of each training block. This is important in our quest to properly apply stress (shock/confuse the body) and promote adaptation for our athletes while avoiding exhaustion/overtraining. It also avoids physiological and psychological stagnation.

Most of these variables seem like common sense, but as Voltaire once said “common sense is not so common.” It’s not magic, some sort of new and innovative exercise. It’s the variables (manipulating the training loads, varying the type of contraction, varying the speed of contraction, varying the exercise) that are the essence of proper, reliable and results driven sports performance programming. Strength and

Conditioning coaches need to have a solid understanding of basic programming variables so that we can provide these results to our athletes and sport coaches.

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