

First of all, thanks for reading the first instalment and starting to read this one; that is the first step. Today I want to let everyone know a bit about the energy systems used while playing ice hockey. Some of you may know way more about the technical side of the physiology than I do but here goes anyhow.

Our bodies use three energy systems while doing physical activity, ATP-creatine phosphate, anaerobic and aerobic. All three are important in one way or another while playing hockey. Here are brief explanations:

ATP-Creatine Phosphate: Adenosine tri-phosphate (ATP) is stored in the muscles for immediate use. ATP is quickly (within 5-20 seconds) broken down into adenosine di-phosphate (ADP). It takes approximately 30 seconds to recover half of the used ATP. This system is used for highly explosive movements such as a sprint from the corner to the front of the net, a hard shot or solid body check. The ATP-CP system is the system mainly used by ice hockey players.

Anaerobic: The anaerobic system starts when the phosphocreatine stores are depleted and lasts around 30 seconds to several minutes burning muscle glycogen and producing lactic acid. Side note, lactic acid causes fatigue and in some cases muscle cramping. This system is used for short to medium term high intensity activity such as a series of sprints or taking a large number of shots. This system is extremely important for ice hockey players.

Aerobic: In the aerobic system, oxygen is used to breakdown carbohydrates first, then fats and finally proteins to fuel long term activity. This system is used for moderate and low intensity activity for a sustained period of time (tens of minutes to hours). The aerobic system helps to remove lactic acid that builds up in muscles during intense activity. An example is jogging. The main function of the aerobic system in ice hockey is to improve recovery. As a hockey shift generally should last 45-60 seconds, the game is far from aerobic but the aerobic system is extremely important for recovering between shifts. A hockey player with a good aerobic system will last longer through games and will find that they are ready for their next shift quite quickly.

Some references I have seen quote ice hockey players using the ATP-CP system 50% of the time, anaerobic 40% and aerobic 10%. This is why I will always emphasize hard explosive movements, sprints and plyometrics. Even though the aerobic system is used at a low percentage it is still very important. Obviously I will never suggest marathon training for a hockey player but teenage hockey players should be able to run several miles with relative ease.

My off-ice routines are structured such that players will go through aerobic warm ups such as jogging, cycling or rowing, stretches, a large series of explosive activities such as sprints, jumps and burpees which hits both ATP-CP and anaerobic systems and ending with aerobic cool-down.

I find it necessary to say that I DO NOT recommend players younger than 16 taking supplements like creatine-monohydrate and in the case of 16-18 they should consult a doctor along with their parents or guardians to make sure that it is, first and foremost, safe as well as appropriate.

I am sorry if this one was a bit dense... they get more interesting from here on out I promise!

Work out of the week for this week: Interval training: anaerobic emphasis - a series of sprints with jogging active rest.

Jog 300 metres – stretch – jog 90 seconds – sprint 15 seconds – jog 90 seconds (repeat 20 times) – slow jog 300 metres – stretch.

Further references on physiology:

Frank W. Dick, Sports Training Principles (London: A & C Black, 2002).

Donald K. Mathews and Edward L. Fox, The Physiological Basis of Physical Education and Athletics (Philadelphia: W. B. Saunders Company, 1993).

Brent S. Rushall and Frank S. Pyke, Training for Sports and Fitness (South Melbourne: MacMillan, 1990).

William D. McArdle, Frank I. Katch and Victor L. Katch, Essentials of Exercise Physiology (Philadelphia: Lippincott Williams & Wilkins, 2006).