
**THE
Hockey Conditioning Handbook**

Don MacAdam

Gail Reynolds

TABLE OF CONTENTS

ABOUT THE BOOK

<u>PART I - THE HOCKEY PLAYER</u>	2
<u>What Makes a Hockey Player?</u>	3
<u>Muscle Abilities</u>	4
<u>Muscle Strength</u>	4
<u>Muscle Endurance</u>	5
<u>Flexibility</u>	5
<u>Energy Supply Systems</u>	5
<u>Explosive Energy Supply System</u>	5
<u>High Energy Supply System</u>	6
<u>Aerobic Energy Supply System</u>	6
<u>A Note About the Nervous System</u>	7
<u>Summary</u>	8
<u>PART II – CONDITIONING</u>	9
<u>What Constitutes Proper Conditioning</u>	10
<u>Principles of Training</u>	11
<u>Additional Training Tips</u>	12
<u>Other Sources of Influence</u>	14
<u>Heredity as an Influence</u>	14
<u>Specificity of Training</u>	14
<u>Summary</u>	17
<u>PART III - THE FOUR TRAINING SEASONS</u>	18
<u>What to do Year Round</u>	20
<u>Off-Season</u>	20
<u>Off-Season Conditioning Objectives:</u>	20
<u>Off-Season Training Emphasis:</u>	21
<u>Aerobics</u>	22
<u>Off-Season Aerobic Program</u>	22
<u>Off-Season Strength Program</u>	24
<u>Equipment</u>	25
<u>Basic Weight Training Program</u>	25
<u>Calisthenics Circuit for Muscle Strength/Endurance</u>	32
<u>Exercise Series</u>	32
<u>Off-Season Flexibility Training</u>	34
<u>Warm-ups Using Loosening Flexibility Exercises</u>	35
<u>Flexibility Training Program for Hockey Players</u>	35
<u>Exercises:</u>	36
<u>Special Concerns</u>	39
<u>Pre-Season</u>	40
<u>Pre-Season Conditioning Objectives</u>	40
<u>Pre-Season Training Emphasis:</u>	40
<u>Off-Ice</u>	41
<u>Foundations</u>	41
<u>High Energy</u>	Error! Bookmark not defined. 40
<u>Keys to high energy training</u>	41
<u>Sample-off ice anaerobic drills</u>	41
<u>Explosive Energy</u>	42
<u>Keys to explosive energy training</u>	42
<u>Sample off-ice explosive energy drills</u>	42

Hockey Conditioning Handbook

[On-Ice](#) 42
 [Foundations](#) 42
 [Sample on-ice aerobic drills](#) 43
 [Sample on-ice muscle strength/endurance circuit](#) 45
 [Exercises](#) 46
 [Sample on-ice flexibility exercises](#) 46
 [Sample on-ice anaerobic drills:](#) 47
 [Sample on-ice explosive drill](#) 49
 [In-Season](#) 52
 [In-Season Conditioning Objectives:](#) 52
 [In-Season Training Emphasis:](#) 53
 [Sample In-Season Training Programs](#) 53
 [Sample on-ice multi-purpose training circuit](#) **Error! Bookmark not defined.**
 [Exercises](#) 55
 [Post-Season](#) 4
 [Post-Season Conditioning Objective:](#) 4
 [Post-Season Conditioning Emphasis:](#) 4
 [Summary](#) 6
[APPENDICES](#)..... 7

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On ice drills were designed using Hockey Blueprint.

Disclaimer: the authors stress that anyone using the exercises, drills, programs and following the information presented in this ebook should do so using proper techniques and following all safety rules. Even if there are no apparent medical issues, consultation with trained medical personnel is highly recommended before training. The authors are not liable for any injury or lack of results from the use of the material presented in this document. Please respect all the principles as presented here, train smart and with dedication to achieve your training goals.

About the Book

THE HOCKEY CONDITIONING HANDBOOK is designed for the players and coaches, regardless of gender, who are serious about performing their best, and for the coach whose job it is to bring that performance to its highest level.

This is a book about **CONDITIONING**. No matter how great a player's skill level or motivation, game performance will only be as good as the player's physical condition allows. A skilled player cannot stop a breakaway if his legs are too tired to let him catch the attacking offensive player. Proper conditioning makes the difference.

The Hockey Conditioning Handbook contains three interrelated parts:

Part I The Hockey Player-what players conditioning needs are

Part II Conditioning-tells how to give players what they need

Part III The Four Training Seasons-tells what to do when

Parts I and II of the book provide the tools you need to build an excellent conditioning program, whether for an individual hockey player or a whole team.

Part III provides sample conditioning programs that help you integrate the principles from Parts I and II into drills, practices and your overall conditioning plan.

Use ***The Hockey Conditioning Handbook*** before, during and after the season. When playoffs are over, the book would be worn out - but not your players.

Best of luck with your hockey training and all your hockey adventures.

PART I - THE HOCKEY PLAYER

WHAT MAKES A HOCKEY PLAYER?

MUSCLE ABILITIES

Strength

Endurance

Flexibility

ENERGY SUPPLY SYSTEMS

Explosive

High

Aerobic

A NOTE ON THE NERVOUS SYSTEM

Summary

WHAT MAKES A HOCKEY PLAYER?

A player who has talent and desire can climb the hockey ladder quickly. But, how often has a team of talented players lost to a less skilled team? We have seen this happen at all levels of the sport. How can such a thing happen?

There are a variety of possible explanations. We have all heard coaches or players say:

“The other team just wanted to win more than we did.”

...blame it on psychology;

“We couldn't seem to control the puck in their end”

...blame it on technique;

“We couldn't keep up with them in the last period”

WAIT A MINUTE! Don't blame the loss on conditioning.

Lack of conditioning is a poor excuse for losing. The knowledge and programs for players to get in great shape are available. All we have to do is use them – on a daily basis. Training is a way of life for any serious athlete. There is no good excuse for a highly skilled hockey player to let his skills and overall game performance slip because of poor conditioning.

A couple of scientific facts have been known for a number of years:

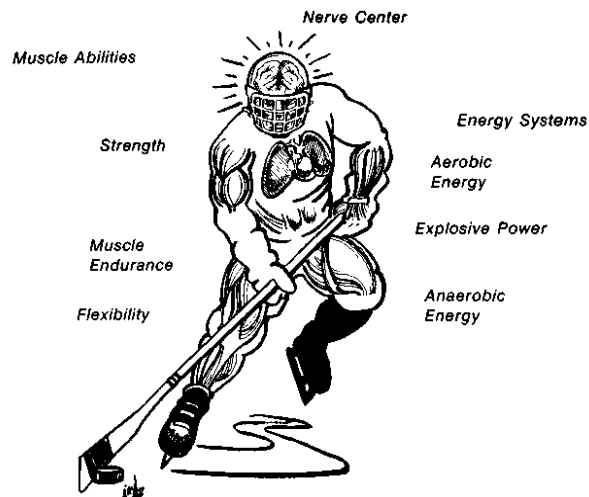
Fact # 1 - Accuracy and power decrease as fatigue sets in.

Fact # 2 - Proper conditioning helps postpone the onset of fatigue.

It's as simple as that-if you want to be able to show off your hockey skills all game long, then get that hockey body in shape. Put off fatigue until after the game is over.

A hockey player is made up of talent, desire and a certain level of conditioning. This book leaves topics like skill development, team play, positional play, strategy, and motivation to other resources.

Now, let's take a closer look at the well conditioned player.



The Well Conditioned Hockey Player

The well conditioned hockey player has highly developed muscle abilities and energy supply systems that help him perform at an elite level. These abilities and systems are coordinated by the nervous system. Here is a closer look at these physical aspects of a player, all of which can be conditioned.

MUSCLE ABILITIES

Muscles have to do the work of skating, shooting, checking and so on. Muscle can range in structure from weak to strong, and tight to elastic. If you expect the muscles to be able to survive the give and take and the rigorous beating that often occurs in hockey, muscle structure must be reinforced to handle it.

Factors that training influences to improve muscle structure are **muscle strength**, **muscle endurance** and **flexibility**.

Muscle Strength

This is the ability of a muscle to contract against a resistance. Muscles are made mostly of proteins. An increase in strength means that the proteins in muscle cells, and the tissues holding them together, are reinforced. Then, when a muscle moves against a resistance (e.g. while checking another player), the muscle is structurally stronger to do the job.

Another example of muscle strength is when you take a wrist shot. The stronger your wrist muscles are as you pull hard on your stick, the more powerful your shot will be.

Muscle Endurance

This is the ability of muscles to repeat or sustain movements. Improvement in muscle endurance is associated with the development of more structures called mitochondria in the muscle. Mitochondria house the machines that produce energy for the muscle. The more machinery you have, the better your resources for keeping a movement going.

An example is when a player, late in a shift, is backchecking and trying to establish good defensive positioning. With good muscle endurance, leg muscles are able to sustain skating movement to get back on the defensive side of the attacking player..

Flexibility

This is the ability of a joint to move through a full range of motion. Elasticity (stretch and recoil) in the muscles that go over joints allows safe and effective use of that joint through its range of motion. Good flexibility means that more power can be generated through the full range of motion of a muscle, and there should be less risk of damaging the joint or muscles (i.e. muscle pulls, tears, and joint dislocations).

For example, the slap shot requires a significant backswing. With good flexibility in the shoulders, a player can get the desired backswing without straining the shoulder muscles. The correct backswing, along with the recoil of the muscles involved, allows the player to generate more power as he executes the shot.

ENERGY SUPPLY SYSTEMS

In addition to developing the structures in muscles, players have to work on different ways of supplying energy to these muscles. This is because hockey is played at different paces, each requiring energy from different sources. In a game, a player spends some time blasting shots, some time sprinting up and down the ice, and time sitting on the bench. Supplying energy for these different paces is influenced by training three different energy supply systems: the explosive, anaerobic and aerobic energy systems.

Explosive Energy Supply System

This energy system is usually considered to be the *power* supply for muscles, because it supplies maximal energy immediately. This intensity cannot be maintained for long. The system's fuel (chemicals known as ATP and PC) is stored in the muscle cells in rather short supply. The fuel runs out in less than 10 seconds of

all-out work. The muscle has to be given rest (30 seconds to 5 minutes) so that the fuel stores can be refilled.

Players use their explosive system every time they make a quick move to release a shot on goal or avoid a check. A goalie making a pad save to his lower left, and reacting to a rebound shot to his upper right, needs explosive energy to get there to make the save.

High Energy Supply System

The high energy system burns carbohydrates (sugars) for fuel which are in greater supply in muscles than the chemicals of explosive energy. However, this fuel produces lactic acid as an exhaust. Acid can build up causing the high intensity activity to drop off after one to three minutes, depending on how well trained the system is. A player must then rest to allow acid to be reduced before high intensity activity can be resumed. It can take up to an hour to remove most of the lactic acid from the system.

A high tempo shift in hockey with no breaks in play requires players to use their high energy system. The explosive system can't last long enough so the sugar needs kick in as a fuel. Players will start to accumulate lactic acid in their muscles. To sustain high tempo play, shorter shifts may be necessary so players get enough rest to reduce lactic acid.

Aerobic Energy Supply System

Aerobic means with oxygen. This system combines oxygen with carbohydrates and fats (and proteins if necessary) to provide a long lasting, low to moderate intensity energy. The 'exhaust' from this system is carbon dioxide, which is normally not a problem. Carbon dioxide can be sent from the muscles back to the lungs and exhaled out of the body.

The aerobic system is responsible for all clean-up operations in the body. It helps replace the chemical stores for the explosive system, and it helps get rid of lactic acid from the high energy system. The aerobic system is indispensable to a player who wants to play high intensity hockey.

For example, during less intense game times, such as a stoppage in play, a well trained aerobic system allows a player to recover more quickly than a player with a poor aerobic system. A player's depleted explosive chemical stores can be refueled, and their lactic acid filled muscles relieved so they are able to perform at an effective level, when the puck drops to resume play.

A NOTE ABOUT THE NERVOUS SYSTEM

In the picture of The Well Conditioned Hockey Player, the nervous system was illustrated. The nervous system is often overlooked in training. In doing so, a player misses the opportunities to improve the programming of the nervous system. The nervous system ultimately coordinates everything that goes on in the body such as recognizing, interpreting and activating a response. If the nervous system is not tuned in with the structural and energy supply capabilities of the muscles, there will be gaps in interpretation and response.

Evidence of the value of incorporating the nervous system in your training program is most apparent when speed is a consideration, which is most of the time in a hockey game.

For example, a player with good wrist strength and good explosive energy stores can still make a poor shot out of a rebound opportunity in front of the net if the nervous system is not trained to quickly coordinate his vision, strength, and energy supply.

The nervous system is very important to hockey players. The training of it must be well integrated with both Muscle Abilities and Energy Supply Systems training. It cannot be trained separately. For this reason, how to train the nervous system is discussed in the "Specificity" section in Part II of **The Hockey Conditioning Handbook**.

SUMMARY

Talent and desire will never be enough for a player who wants to perform at the top of his game. A hockey player must be well conditioned to handle three periods of hard, fast, high intensity hockey. He also has to have sufficient conditioning to play at a high level over the course of a long, demanding season.

Conditioning has to include ALL physical aspects of the body because a game of hockey requires use of all muscle abilities: **strength**, **endurance** and **flexibility**, all energy supply systems: **explosive**, **high** and **aerobic**, and the common factor to all, the **nervous system**.

Muscle strength is the ability of muscles to contract against a resistance.

Muscle endurance is the ability of muscles to repeat or sustain movements.

Flexibility is the ability of a joint to move through a full range of motion.

Explosive energy is power and supplies the muscles with maximal energy immediately to a maximum of 10 seconds.

High energy powers the body for those 30-90 second high tempo shifts as it burns carbohydrates for fuel.

Aerobic energy is the long lasting, low to moderate intensity energy that replaces explosive energy stores and cleans out lactic acid from the muscles.

The nervous system coordinates the efforts of the muscles and the energy systems. Specificity of training will help the nervous system positively impact training.

Move on to Part II to find out how to create the Well Conditioned Hockey Player.

PART II – CONDITIONING

WHAT CONSTITUTES PROPER CONDITIONING?

PRINCIPLES OF TRAINING

ADDITIONAL TRAINING TIPS

OTHER SOURCES OF INFLUENCE

Heredity

Specificity

Summary

WHAT CONSTITUTES PROPER CONDITIONING?

There are a couple of myths that must be dispelled concerning hockey conditioning.

Myth # 1: Proper training means dedicating hours and hours exclusively for conditioning work.

Some time commitment is necessary for proper conditioning. Specific workout durations depend on the season and the conditioning needs of the player. With a little knowledge of training principles and planning, training can be integrated into drills and daily routines so it does not monopolize practice time. This book will show you how.

Myth # 2: Doing something is better than doing nothing.

Improper training can be a complete waste of time, and in some cases, it can actually be dangerous. It is important to determine exactly what you need to train and how to best go about doing that.

The left side of the following chart lists those physical aspects of a hockey player that must be conditioned. The right side of the chart provides guidelines that will ensure safe and effective conditioning.

Commit the guidelines to memory. Then, be sure to check out the additional training tips listed following the chart.

Sample conditioning exercises are included on the right side of the chart.

PRINCIPLES OF TRAINING

What to Train	Guidelines for Proper Training
<i>Muscle Abilities:</i>	
Strength	<ul style="list-style-type: none">• Use high resistance (90-100%) and a low number of repetitions (1-3 reps).• Train alternate days for improvement; once every two weeks for maintenance. <p>Example: 3 chin-ups using a weighted belt.</p>
Endurance	<ul style="list-style-type: none">• Use low resistance (50-60%) and a high number of repetitions (15-30).• Train 3-5 days per week for improvement; once or twice per week for maintenance. <p>Example: Set of 30 regular bent leg sit-ups.</p>
Combination Strength/Endurance	<ul style="list-style-type: none">• Use medium resistance (60-80%) and a medium number of repetitions (3 sets of 8-12 reps).• Train 3 to 5 days per week depending on resistance being used; once per week to maintain. <p>Example: 3 sets of 10 sit-ups with a light weight on chest.</p>
Flexibility	<ul style="list-style-type: none">• Stretch slowly as far as possible, hold that position for 10-30 seconds as you relax the muscle that feels tight.• Repeat 3 times. <p>Example: Toe touch.</p>

Energy Supply Systems:

Explosive

- Go 'all out' for 5-10 seconds, rest 30-60 seconds. Repeat 6-12 times.
- Train 3-6 days per week; twice a week to maintain.

Example: Sprint blue line to blue line 3 times then skate an easy lap.

High

- Go as hard as possible for 40-90 seconds, rest equal or double this time. Repeat 3-10 times.
- Train alternate days to improve; once per week to maintain level.

Example: Sprint 1 lap of a normal track then walk or jog the next _ lap.

Aerobic

- Go 15-30 minutes at a brisk pace using large muscle groups. Keep the activity as continuous as possible. Brief intervals (up to 30 seconds) of easier activity every 3-5 minutes are acceptable.
- Train 3-5 days per week for improvement; once or twice per week for maintenance.

Example: Cross-country running or skiing, biking, roller blading, swimming, or skipping.

ADDITIONAL TRAINING TIPS

Use the preceding guidelines for both dryland and on-ice conditioning.

1. Start training at a level that players can handle comfortably. Then, work toward higher intensities and durations GRADUALLY. Too much too fast can expose a player to unnecessary injury and discourage the athlete.
2. It is important that the guideline intensities are strictly adhered to. If intensities are not met, the training will not be effective. This means you could

be training negatively. Check to see if you are working at the right intensity for aerobic or high energy training by counting your heart rate for 6 or 10 seconds during the activity. Heart rate should be in the range of 150-170 for aerobic training and 180-200 for high energy training.

If you are over 25 years of age, see Appendix A for Age Adjusted Target Training Heart Rates. Check with your doctor before starting a training program, especially if you have any health concerns.

3. Any conditioning program for strength/endurance development should also include flexibility work. If muscles are only contracted and not stretched, they lose their elasticity. Also, if muscles are only stretched, they tend to lose their resilience.
4. All muscle groups around a joint should be worked in pairs to maintain joint stability. If muscles on the front of the leg are worked, do a similar exercise for the partner muscles on the back of the leg.

Example:

If you do sit-ups for your abdominal muscles, you need to do back leg raises for your lower back. An imbalance in strength is a common cause of knee injury and lower back pain - two common problems of hockey players.

5. Conditioning principles are basically the same for any age or sex. There are some precautions to consider. Youths who are growing rapidly (pre-puberty) should NOT do heavy strength or high energy work, or be subjected to severe diet restrictions for weight loss purposes. These three aspects of conditioning can be too hard on a body which is attempting to lengthen bones, sort out chemistry and keep coordinated. Also, players over 40 should proceed cautiously with strength and high energy work, particularly if they have been relatively inactive for a few years. Strength and high energy training place considerable stress on the heart, so it needs to be in good shape aerobically to handle such work. Remember to start at a comfortable level and progress gradually.

The preceding **Principles of Training** chart and these additional tips provide the basis for effective training. All are simple. It just takes a bit of planning to work them into practices and make them every day habits.

OTHER SOURCES OF INFLUENCE

Proper conditioning can help make a poor player good and a good player better. There are a few factors in conjunction with conditioning that can also be an influence on performance. A coach or player should be aware of the relationship between **heredity** and **specificity of training**, on the ability to improve performance.

Heredity as an Influence

The suggestion has often been made that athletes are born, not made. There might be some truth to the adage for a few sports; ice hockey is not one of those.

Body structure and muscle fiber (cell) type appear to be inherited. If your personal genetic make up dictates fine bones and slender muscles, there is no natural type of conditioning that can transform you into a muscle bound mass. And if your genetic plan dictated that you have more slow twitch (aerobic) cells than fast twitch (power) cells in your skating muscles, you will never become the fastest player on skates. But, all you need to do is look around. Good players have always come in all body shapes and sizes. Players just need to work with their genetic package and train accordingly.

It is important to know that all physical aspects of conditioning can be improved--with proper training. Heredity just sets the upper limits. Because hockey incorporates the use of all physical aspects to such an extent, any given inherited advantage usually means adjustments in other aspects of the game. The greatest advantage comes by using proper training to minimize inherited disadvantages and maximize inherited strengths.

Specificity of Training

The concept of specificity means that, to get the best training results, you must train exactly what you want in precisely the manner that you want to be able to use it. This is the concept players frequently use in an argument against dryland training...”but running uses different muscles than skating.” This is partly true, but there is more to the argument. Running on sand dunes may be more specific because the leg action is more similar to skating than that of regular running. Regardless, the same heart, lungs and major blood vessels that will be used in a game are being developed with training.

Specificity has to do with structures, chemicals and the nervous system. Only those structures that are directly involved in an activity receive a stimulus to develop during exercise. The same is true for chemicals involved in energy production. Nervous system specificity relates to the precision with which a response pattern has been programmed. Implications for hockey from this information suggest the following:

- If the leg muscles most often perform skating movements at a moderate pace, then no nerve pattern is implanted for fast pace skating movements. If fast skating is suddenly attempted, the results will not be particularly effective because the nervous system is not used to calling on the cells, chemicals, and pathways for this type of action.
- If you want to increase strength in the forearm and wrist muscles to improve your wrist shot, strength training must be done using the forearm and wrist (grip) muscles. Shoulder muscle strength training won't help very much at all. Strength work must use the muscles through the range of motion and angles that the wrist will use during the wrist shot. And, the strength work must eventually build up to the speed of the actual shot. By training this way, the specific structures, energy services (chemicals) and neurological programs that are needed will be stimulated.
- If you want to increase explosive power, you must do drills at an explosive intensity. That is the only way to stimulate use of explosive chemicals. Eventually these drills must include the actual skills of the game so that the skill pattern is integrated with the increase in speed.
- If a player's shift includes 30-60 seconds of hard skating alternating with 1-2 minutes of rest (between shifts), then practice drills should have at least 30-60 seconds of hard skating alternating with 1-2 minutes of rest. This will equip the muscles and recovery mechanisms to handle such work in a game.

The key concepts in making conditioning specific are:

- Specific Muscle Groups
- Specific Joint Angles
- Game Pace/Intensity

During the off-season and preseason, specificity in practices may be difficult due to lack of facilities or the low skill level of the players. Specificity must become a top

priority in late preseason and in season so that players have exactly what they need at game time.

SUMMARY

Proper conditioning will mean incorporating basic training principles into practice plans and daily training routines for each player.

These principles reflect **intensity**-how hard, **duration**-how long, and **frequency**-how often each type of training must be done to be effective.

Evidence suggests that, although heredity can influence performance, proper conditioning can help optimize this influence.

Specificity of training is important when planning any type of training. This will help optimize the carryover from training to game performance. The key concepts in specificity are: **specific muscle groups**, **specific joint angles**, and **game pace/intensity**.

PART III - THE FOUR TRAINING SEASONS

WHAT TO DO YEAR ROUND

OFF-SEASON

Objectives

Emphasis

Off-Season Aerobic Program

Off-Season Strength Program

Basic Weight Training Program

Calisthenics Circuit for Muscle Strength and Endurance

Flexibility Training

PRE-SEASON

Objectives

Emphasis

Off-Ice High Energy Training and Drills

Off-Ice Explosive Power Training and Drills

On-Ice Aerobic Training and Drills

On-Ice Muscle Strength and Endurance Circuit

On-Ice Flexibility Exercises

On-Ice High Energy Drills

IN-SEASON

Objectives

Emphasis

Sample Programs

POST-SEASON

Objectives

Emphasis

Sample Programs

Summary

WHAT TO DO YEAR ROUND

There was a time when hockey players could just show up at the rink in the fall and start playing at a competitive level and then forget about hockey for the rest of the year. That is not to say the game cannot be played for a few months each year for fun. For anyone who is serious about making the most of his hockey abilities, certain aspects of the game must be developed beyond just the playing season. Bodies take time to adjust to be able to handle the rigors of hockey. Conditioning for serious hockey players is now considered a year round process.

This does not mean that ALL aspects of conditioning must be worked on ALL the time. Some aspects are gained or lost much more quickly than others. Aspects like aerobics provide a foundation for training the others more effectively. There are priorities for conditioning at different times of the year.

The hockey season can be divided into four distinct training seasons:

- Off-season
- Pre-season
- In-season
- Post-season

The length of each season will vary depending upon the level of hockey you are playing at.

Whether you are playing minor hockey, major junior, university, pro, or recreational adult hockey, the training priorities for each season are the same.

THE OFF-SEASON

The off-season is the starting point for a hockey player. What is done at this time can make or break a season. There is little opportunity for catch-up where conditioning is concerned once the playing season approaches.

**Off-Season
Conditioning
Objectives:**

- 1) Build the Physical Foundations
- 2) Eliminate Physical Weaknesses

A player must first establish the basics of conditioning that will enable him to meet the specific demands of the coming season. Conditioning basics include **aerobics**, **strength** and **flexibility**.

Aerobics is a foundation of conditioning because it prepares the heart, lungs and blood supply network to better feed the muscles during work sessions. This also allows for better servicing of the muscles during clean-up operations (recovery).

Strength is a foundation because it enables an athlete to perform the skills of the sport with greater power and ease.

Flexibility is a foundation of conditioning because it establishes the range of movement around a joint that an athlete can use to optimize power and to reduce strain-type injuries.

A player with a sound aerobic, strength and flexibility base is well prepared to handle the rigors of hard practices and the demands of tough high energy and explosive training.

Beyond the basics of conditioning, an underlying physical weakness may be negatively affecting a player's performance. For example, weak wrist strength will prevent a player from developing an effective wrist shot. The off-season is the time to eliminate any weaknesses.

Other common special concerns include building more muscle bulk to increase playing weight, working on lateral leg strength to improve agility, or doing additional power work to develop quickness for the legs or upper body.

Off-Season Training Emphasis:	<ol style="list-style-type: none">1) Aerobics2) Strength3) Flexibility4) Special Concerns
--------------------------------------	--

Use the off season to set yourself up properly for the coming season. Following are some samples of training programs that have been used to help players meet their off-season conditioning objectives.

Aerobics

The most common mode of aerobic training is running. At the higher levels, the following running program combines pure aerobic work with light high energy and explosive energy work that is appropriate for the off-season.

Be sure to read the introduction to the program carefully. Note that target heart rates are for athletes up to 25 years of age. See Appendix A if you are older. This aerobic program is also adaptable for cycling. Gains will be effective, IF the same intensity of work is maintained. Cycling is a good program to follow for those with any leg problems (i.e. bad knees, shin splints, ankle injuries. etc.). Swimming or skipping could also be substituted although target heart rates are more difficult to reach. Aerobic training can be combined with other training programs. For example, weight training could be done on Monday, Wednesday and Friday with aerobics going Tuesday, Thursday and Saturday.

Off-Season Aerobic Program

Start your training at the Level that maintains your heart rate above 160 beats per minute during the continuous work periods (CBE) and above 180 beats per minute when you are on a speed-play section (i.e. in Level III). Rest means a loose, easy jog. Walk only when unable to continue the program at the required pace.

Work at one Level until you feel that you dominate rather than struggle at the end of the session. One level may take one day, three days, a week or more. Then progress to the next level. The objective is to be working above Level X when pre-season training begins. Mileage indicated below is estimated for running. If you prefer, or you encounter injuries, etc., use cycling for the same work times and disregard the mileage.

Level I	<ul style="list-style-type: none">• 15 min. Continuous Brisk Effort (CBE)• (2-2_ miles)
Level II	<ul style="list-style-type: none">• 15 min. CBE• Rest 1_ min.• 5 min. alternating 150 hard; 50 jog
Level III	<ul style="list-style-type: none">• 15 min. CBE• Rest 1 min.• 5 min. alternating 150 hard strides; 50 jog strides

Level IV	<ul style="list-style-type: none">• 15 min. CBE• Rest 30 sec.• 5 min. alternating 150 hard; 50 jog
Level V	<ul style="list-style-type: none">• 20 min. continuous effort of 15 min. CBE plus• 5 min. 150:50• (no rest)
Level VI	<ul style="list-style-type: none">• 20 min. as in Level V• Rest 1.5 min.• 5 min. strong pace (minimum _ mile)
Level VII	<ul style="list-style-type: none">• 20 min. as in Level V• Rest 1 min.• 5 min. alternating 50 sprint strides; 30 jog strides
Level VIII	<ul style="list-style-type: none">• 20 min. as in Level V• Rest 30 sec.• 5 min. alternating 50 sprint strides; 30 jog strides
Level IX	<ul style="list-style-type: none">• 25 min. continuous effort with first 15 min. CBE; then 5 min. 150:50, then 5 min. 50:30• (Speed on second '50' should be faster than on '150')
Level X	<ul style="list-style-type: none">• 25 min. as in Level IX• Rest 1_ min.• Min. strong pace (minimum _ mile)
Level XI	<ul style="list-style-type: none">• 25 min. as in Level IX• Rest 1 min.• 5 min. alternating 10 strides ALL OUT; 10 jog with 20 strides ALL OUT; 50 jog
Level XII	<ul style="list-style-type: none">• 25 min. as in Level IX• Rest 30 sec.• 5 min. alternating 10 ALL OUT; 10 jog with 20 ALL OUT; 50 jog

- Level XIII
- 30 min. continuous effort with first 15 min. CBE; then 5 min. 150:50, then 5 min. 50:30. Then 5 min. 10:10:20:50.
 - (The '10' and '20' ALL OUT strides should be the fastest you are capable of ever pushing. Total target is 4-5 miles.)
-

NOTE: You **MUST** work out a minimum of 3 times per week if you hope to see progress. Five times per week will produce faster results. You should then alternate speed-play days with days using the same total work time, all at CBE.

Speed-play hangover can last about 48 hours at the higher work levels, (i.e. Level VII thru Level XIII).

Off-Season Strength Program

The most common mode of strength training is **WEIGHT TRAINING**. It allows for a great deal of versatility so that individual training goals can be reached.

Here are a few basic principles of weight training that must be recognized before starting.

- Combining low resistance and high repetitions with an exercise will primarily develop **ENDURANCE**.
- Combining high resistance and low repetitions in an exercise will primarily develop **BULK** and **STRENGTH**.
- To reach a balance of strength/endurance in a strength exercise, base workouts on 3 sets of 8-12 repetitions.
- Muscles should be worked through a full range of movement in every exercise repetition for maximum strength gains.
- When training, muscle fatigue should be built up to the point of almost total fatigue at the end of the last repetition in the last set.
- Increase weight when the last set becomes manageable. If you have reached your desired strength level, stay at the same weight and increase the number of repetitions.
- Exercises should be organized so that major large muscle groups are exercised first, then work the smaller muscle groups. Be sure to work the muscle groups on both sides of each joint.
- Do all sets of one exercise before moving to the next muscle group.
- Always do a thorough warm up before starting, and stretch the muscles being worked between exercises.
- Adhere to all safety factors (i.e. proper technique, work with a Partner/spot each other, proper use of equipment, proper dress).

- Breathing should be controlled. Breathe ‘out’ when the major effort is being exerted during an exercise, and ‘in’ when the weight is being moved in the opposite direction.

NOTE: Fast growing younger players should NOT do high resistance strength training. There may be too much stress for developing bones, muscles, and joint structures to handle. A light weight or calisthenics exercise circuit using one's own body weight is a safe and effective alternative.

Equipment

There are several different ways to do strength training. The most common is using free weights, such as barbells and dumb-bells. Other equipment includes isokinetic machines, universal gyms, skating treadmills, sliders, exercise balls, medicine balls, and calisthenics, with or without weights. Significant strength improvements can be gained using any method, as long as basic training principles are followed. Utilize the concept of specificity (outlined in Part ii) as much as possible. Equipment limitations and availability may restrict your opportunities, but there is always a way to get the job done.

We did not include unstable weight training using an exercise ball. This is advanced training and is a demanding way to work out. Refer to **52 Week Training for Hockey** in Appendix B for detailed information in this area.

Following are examples of weight training and calisthenics programs. A chart to monitor progress is included after the weight training program.

Basic Weight Training Program

This program is designed for players who have never weight trained before, or for players who have had an extended break in their strength training program. It covers all major muscle groups needed for hockey. Proper techniques are outlined.

Start with very light weight and get comfortable with the exercise techniques and correct breathing.

Exercises:

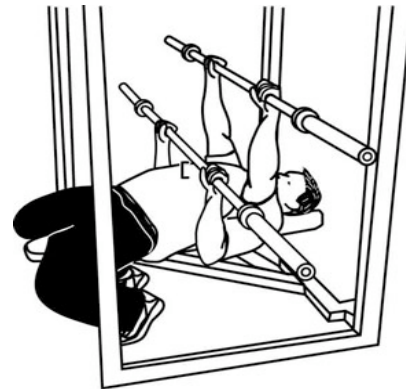
1. **Dead Lift (Back and Legs).** Address the bar using a reverse grip (one palm facing forward, one backward) and feet shoulder width apart. Have the back at 35-40 degrees to start.

First, straighten legs only, keeping the back at the same angle and arms extended. Then, when legs are straight, pull back to upright position with shoulders back.

Return to start position by reversing the exercise i.e. back at 35-40 degree angle, bend legs until bar touches the floor. Repeat.



2. **Bench Press (Chest, Shoulders, Arms).** Lying on bench with feet flat on the floor, grasp the bar with palms up, hands shoulder width apart. Extend arms upwards completely, now lower the bar down until it touches the chest.



3. **Squats (Legs).** Bar rests across the shoulders and balanced with your hands (palms facing forward). Feet are shoulder width apart. There will be a slight forward lean to the upper body. Bend your knees until your thighs are parallel to the floor. Keep the head up and breathe out as you return to start position.



4. **Shoulder Shrugs (Shoulder Girdle).** Using dumb-bells to the side of the body, or barbell with reverse grip, rotate shoulders in a complete circle (forward to backward). Move through the greatest range of motion possible, keeping arms

straight and head up.

5. **Flys (Upper Body).** Using an incline bench (45° or higher) and dumb-bells. Start with the arms straight and over the shoulders. Bend the elbows slightly and drop the weights to the side, as low as possible. Next, lift the dumb-bells upward until the arms are straight.



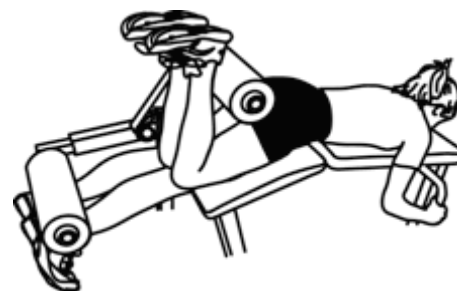
6. **Bent Over Row (Upper Back).** Leaning over to 90° at the waist and starting bar near the floor, raise the barbell until it touches the chest. Lower the weight until the arm is fully extended. Keep both feet on the floor and keep legs stiff.



7. **Leg Extension (Thighs).** Seated with hips and shoulders against the bench, extend legs completely using a 2 count, pause, then return slowly to starting position using a 5 count. This can be done using one or both legs. Use hand grips for stability.



8. **Leg Flexion (Hamstrings).** Lying face down on the bench, place feet under pads and grasp hand grips. Bring feet up until pads touch the buttocks, using a 2 count, pause, return to starting position slowly using a 5 count.



9. **Heel Raises (Calves).** With weight resting on shoulders and feet flat on the floor, raise the weight keeping only the toes on the floor. The heels should be lifted as high as possible then returned to the floor. (Elevate toes for greater range of movement, as illustrated).



10. **Toe Raises (Shin Muscles).** Sitting on a high bench or table, have the legs hanging over the side. The lower leg remains stationary. Raise the toes toward the shin as high as possible and return to starting position. Use a barbell plate attached to the toes with a rope to provide resistance.

11. **Bicep Curls (Biceps).** Grasp dumb bells with palms up. Have shoulders and buttocks against a wall and feet 12-18 inches (15-30 cm.) from wall and shoulder width apart. Weight starts on thighs and is curled upward until it touches the chest, then return to starting position.



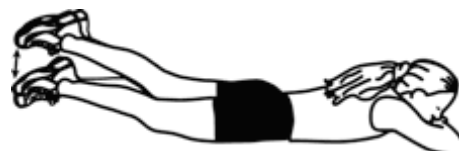
12. **Triceps Curls (Triceps).** Using dumb-bells, start with arm extended straight over head. Lower weight behind the head until it touches the back, or as low as possible. Return to starting position. Curls can be done seated and with a barbell or dumb-bells.



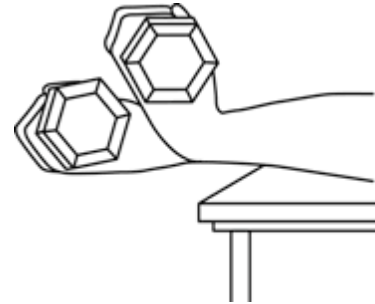
13. **Sit Ups (Abdominals).** With legs bent bringing the heels as close to the body as possible, grasp hands behind the head and raise upper body until elbows touch legs. Return to start position and repeat.



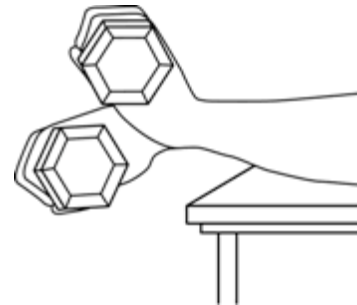
14. **Back Leg Raises (Lower Back).** Lying on your stomach, raise legs as high as possible, and hold momentarily at highest point. Return legs to the floor and repeat. Avoid swinging the legs. Keep the upper body on the floor.



15. **Wrist Curls (Forearms).** Be seated with feet on the floor and forearms resting on the thighs so that wrists extend out over the knees. Have thighs parallel to the floor. Keep forearms on thighs throughout the exercise. Using palms up grip on dumb-bell curl the barbell as high as possible. Lower to fingertips and repeat. (Diagram uses a bench/table instead of thighs).



16. **Reverse Wrist Curls (Wrist Extension).** Use the same position as #15, with palms down. Use the same action. (Diagram uses a bench/table instead of thighs)



There are sixteen exercises outlined. You may not have the time, or even need to do all sixteen. Remember to select your exercises with the following points in mind:

- Include these 8 core exercises that work the major hockey muscle groups:
 - Bench Press
 - Biceps Curls
 - Triceps Curls
 - Wrist Curls
 - Leg Flexion
 - Leg Extension
 - Sit Ups
 - Back Leg Raises
- Incorporate additional exercises that will help you develop any weaker areas of your body.

As an example, if you want to develop better wrist strength, then you would add reverse wrist curls.

As you start to train, be comfortable with the techniques involved in each exercise and the overall workout you put together.

Use a chart to monitor your weight training progress. The following chart is a good basic design that can be modified to meet specific needs. Keep the charts in a binder for an accurate record of training.

Hockey Conditioning Handbook

Name: _____ Date: _____

Team: _____

Height: _____ Weight: _____ Age: _____

Warm Up: _____

Exercises	Day:			Day:			Day:			Day:			Day:		
	WT	REP	SET	WT	REP	SET	WT	REP	SET	WT	REP	SET	WT	REP	SET
Dead Lift															
Bench Press															
Squats															
Shoulder Shrugs															
Flys															
Bent Over Rowing															
Leg Flexion / Leg Extension															
Heel Raises / Toe Raises															
Biceps Curls / Triceps Curls															
Sit-ups / Back Leg Raises															
Wrist Curls / Reverse Wrist Curls															

Cool Down: _____

Comments: _____

Calisthenics Circuit for Muscle Strength/Endurance

Instructions

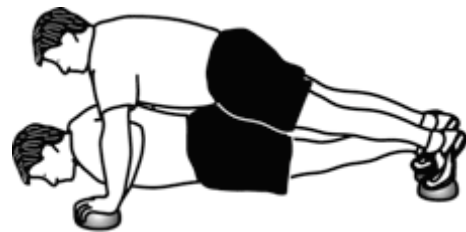
Do a regular warm up and cool down. Aerobic training may be done either before or after this circuit. Perform 15-30 repetitions of each of the following exercises in the order the exercises are listed. Rest 3-5 minutes, then repeat the series 2-3 times. Exercises may be modified to easier/difficult levels to accommodate younger/older, stronger/weaker athletes. Any modification needs to work the same muscle groups as the original exercise intended.

Facilities

A gym, athletic field, or basement recreation room can be used. The only equipment necessary is a bench or bleacher, a low place to hold the feet and a way of marking a few lines on the floor or ground.

Exercise Series

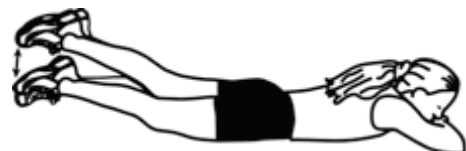
1. **Push-Ups.** Keep hips straight, lower trunk to within 1_ inches (4 cm) of floor, then extend elbows completely. Weight (e.g. a weighted back pack) may be added to the shoulders to increase resistance.



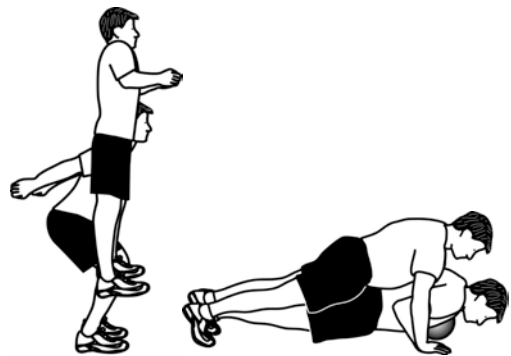
2. **Twist Sit-Ups.** Feet flat on the floor, and clasp hands behind head. Curl up to touch right elbow to left knee, uncurl, then repeat for left elbow to right knee, weight may be added on the chest.



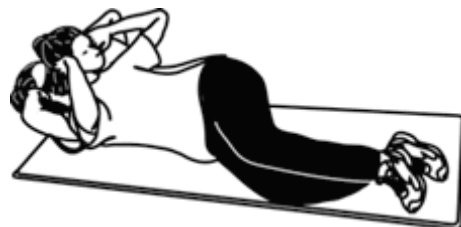
3. **Back Leg Lifts.** Lie face down on floor with feet touching floor. Lift legs as high as possible, pause, then lower (do not `swing' legs). Weight may be added above knees.



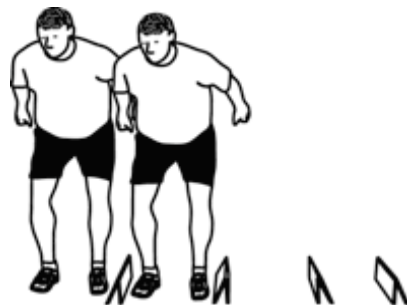
4. **Burpees.** From standing position, drop to crouch position, extend to push up position, return to crouch position, explode to maximal vertical jump, then repeat sequence.



5. **Lateral Curls.** Lie on side with feet held stable and hands clasped behind head. Curl up as if trying to touch right elbow to right hip. Complete all repeats for one side before going to other side. Weight may be added at the chest to increase resistance.



6. **Bench/Line Jumps.** Jump back and forth over a low bench, or mark lines approximately 3 feet/1 meter apart (as illustrated) and jump alternating 3 times to each line. Jump using two feet initially and ultimately work toward using one foot only then repeat for the other leg.



7. **Dips.** From a sitting position at the edge of a bench, with legs extended straight to the floor or to another bench, lower the hips toward the floor, then press up until elbows are straight. Keep hips close to the bench at all times. Weight may be added at the shoulders or hips. Start as pictured, if using a second bench is too difficult. (Bent legs are used in the illustration to show a beginner level).



8. **Step-Ups.** Step up and down from a high bench as quickly as possible. When required repeats are completed once, switch to use opposite lead leg. Higher steps or dumb bells can be added to increase the level of difficulty of the exercise.



Off-Season Flexibility Training

There are many reasons of doing flexibility training:

- Increase the range of movement around joints
- Help prevent injuries, in particular muscle strains
- Reduce muscle tension and soreness
- Help players relax before competition
- Make the athlete more aware of his body
- Lubricate joints in preparation for physical work

There are two different types of flexibility work; **warm up/cool down flexibility** work and **flexibility training** work.

Warm up/cool down flexibility serves mainly to loosen up and lubricate joints. These can be done off ice prior to practices and games and after both to reduce tension and soreness. They are also a good lead-in to doing training flexibility work.

Training flexibility will actually improve the range of motion and reduce muscle tension and soreness.

Flexibility is best done at the end of a workout when the muscles are warmed up. Flexibility work for the purpose of tension reduction is also most effective if used after at rest intervals or at the end of a workout. Samples of both types of programs follow. These exercises can be done on or off ice. Be sure that clothing or equipment does not restrict the range of motion.

Warm-ups Using Loosening Flexibility Exercises

Warm-ups should typically be designed in three phases:

- I. A loose and gradual heat up for muscles, followed by
- II. Loosening and lubricating joints, and finishing with
- III. Activities very specific to the upcoming activity.

This sequence can take from 5-20 minutes to do effectively, depending upon the intensity and complexity of the upcoming activity. Suggested warm-ups for hockey practices, games or training sessions follow.

Phase I

- loose jogging that increases to moderate paced running; easy skating that changes to exaggerated skating movements then strong skating.
- whole body calisthenics that get progressively more aggressive (i.e. run-on-the-spot, jumping jacks, burpees).

Phase II

- a complete sequence of swings and rolls in both directions:
 - arm swings or circles
 - leg swings or circles
 - head rolls
 - shoulder rolls
 - trunk circles
 - knee circles
 - ankle rolls
 - wrist rolls
 - trunk twists

Phase III

- very specific activities may include:
 - a few hard sprints
 - exercises or skating the lines
 - groin stretches for all players
 - shoulder stretches for shooters
 - split stretches for goalies

Flexibility Training Program for Hockey Players


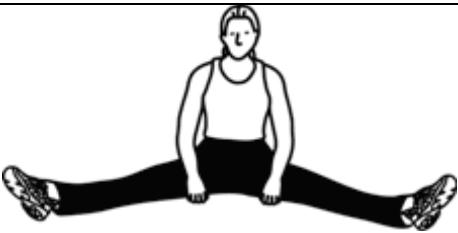

Technique: in all of the following exercises, stretch to the point of definite, but not painful, tension. HOLD means stay in that position until you are able to relax or

‘drain’ the feeling of tension at the point where the muscle feels tight (10-30 seconds). Release from the stretch position and relax. Repeat the stretch again at least 3 times. Once ‘draining the tension’ becomes easier, stretch a little farther and drain the new tension point each time during holds.

Note: Do not hold your breath while stretching. Be relaxed enough to breathe naturally.

Frequency: Do at least one of the following exercises for each of the major body parts (calves, hams, quads, groin, trunk front and back, sides and shoulders) after every game or workout. Some stretch sequences service more than one body part. It may be a matter of using only 3 or 4 exercises in total. You should conclude with Exercise 12.

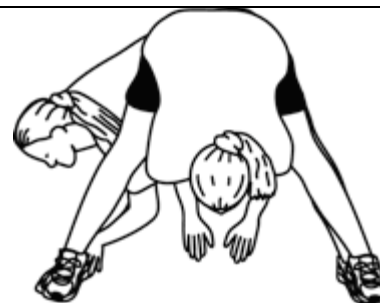
Exercises:

<p>1. Long Sit Stretch. Point toes toward knees. HOLD. Release. Press stomach to thighs, then drop head toward knees. HOLD.</p>	
<p>2. Straddle Sit Stretch. Point toes toward knees. HOLD. Release. Press stomach toward right thigh, then, drop head toward knee. HOLD. Release. Repeat toward left thigh and knee. Repeat straight forward by pressing the stomach then dropping the head toward the floor.</p>	
<p>3. Hurdle Stretch. Point toe of straight leg toward knee. Hold. Release. Press stomach toward straight leg, then drop head toward knee. HOLD. Release. Lie back on floor pressing bent knee to floor. HOLD.</p>	

4. **Squat Stretch.** From a squat position press heels to floor. HOLD. Extend knees until straight, keeping hands on floor. HOLD. Slowly straighten up back working from base of spine up. Continue beyond vertical to back bend position. HOLD. Slowly straighten up working from base of spine up. Bend left. HOLD. Straighten from base of spine up. Repeat to right.



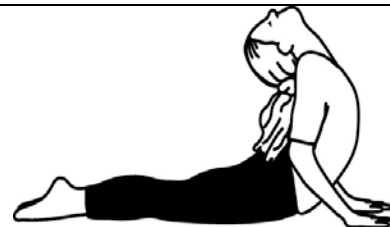
5. **Straddle Stretch.** Dip low in a lateral lunge position keeping both feet flat on the floor pointing straight forward. HOLD. Grasp ankle then extend right knee keeping your head as close to the knee as possible. HOLD. Release grasp and press elbows as close to floor in centre as possible. HOLD. Repeat sequence to left side.



6. **Forward Lunge.** Dip as close to the floor as possible keeping back erect and knee of extended leg straight. HOLD. Repeat with reverse leg positions.



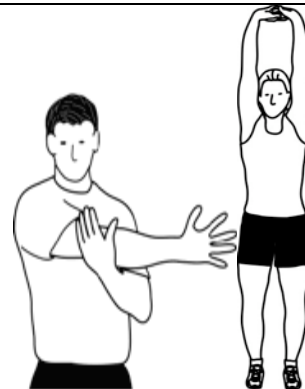
7. **Drop Hip Stretch.** From a front lying position, press shoulders up off floor as high as possible while relaxing trunk to keep hips on floor. HOLD.



8. **Gluteal Stretch.** From a sitting position with one leg extended and the other crossed over with the foot on the floor above the knee, press the bent knee toward the opposite shoulder. HOLD. Repeat reversing leg positions.



9. **Shoulder Stretches.** Press at the elbow as the arm is extended across the chest. HOLD. Press at the elbow as the hand reaches as far across your body as possible. HOLD. Grasp hands behind your back, press them up as high as possible. HOLD. Rest hands on something about waist high and press shoulders down. HOLD. Grasp hands above your head with palms up. Press up and HOLD.



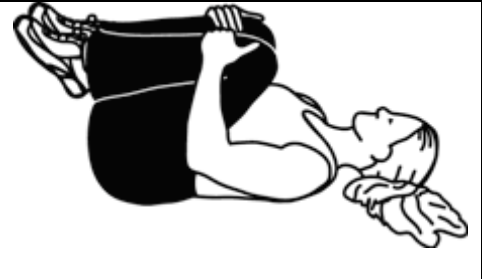
10. **Calf Stretches.** Take a stride position. Keeping the feet pointing forward and the back leg straight with the heel on the floor, press the hips forward. HOLD. Release. Repeat using reverse leg positions.



11. **Reverse Hurdle Stretch.** Sit with bottoms of feet together. Press down on knees. HOLD. Extend one leg in front. Press stomach toward thigh and drop head to knee. HOLD. Lie back and relax pressing small of back to floor and let gravity press on knees. Hold. Repeat from beginning, using other leg extended.



12. **Lower Back Relaxor.** From back lying position press lower back into floor. HOLD. Draw left leg to chest. HOLD. Repeat for right leg. Draw both legs to chest. HOLD.



Special Concerns

Identify your major weaknesses from the previous season. Decide what physical aspects could contribute to improving the weaknesses and design a special training drill to work on these aspects. Some examples follow.

For quicker wrist shots - using a regular or weighted hockey stick, take a series of quick release shots at a target using regular or weighted pucks. Rest and repeat 5-10 times. Gradually increase the weights being shot, but use regular pucks occasionally to coordinate accuracy and control with the increase in strength.

For greater explosive leg power, run 5-10 10-second sprints up sand dunes, bleachers, or a long staircase. If none are available, repeat the following series 8-16 times, using the sequence of both legs on the first repeat, right leg only on the second, left leg only on the third and finish with a both leg set. The series is:

1. 3 maximum height tuck jumps
2. sprint 10 meters, stop-turn-start, sprint back
3. 12 patterned line hops (3 short, 3 long) x 2
4. sprint 10 meters and back as above
5. 3 burpees with a maximum jump

A reasonable level of conditioning for ice hockey takes about 12 weeks of training to establish. This time can be reduced if you never let yourself get too far out of shape. Fine tuning for hockey can take a little longer because you always want to build on the basics. It is important to establish the basics (aerobic, strength and flexibility) in the off- season. Then you will be in a position to top up your training and skills when the pre-season starts.

PRE-SEASON

Pre-Season means on-ice workouts have started but league games have not. It's your last chance to get all your conditioning ready for the ultimate test – game time.

**Pre-Season
Conditioning
Objectives:**

- 1) Top Up Off-Season Levels
 - 2) On-Ice Transfer of Conditioning
-

The first part of the pre-season usually has 2-3 weeks of dry land training for ‘topping up’ your off-season training. The off-season foundations must then be adapted to the ice. Your running legs get switched to skating legs. This is also the time to incorporate specific high energy and explosive energy training. Dry land work can be done to help develop these energy systems initially. But it will be essential to ultimately train these two systems on ice as well.

During the pre-season a player should be able to gradually reduce his aerobic workouts from 5-6 per week to 2-3 per week, with at least 1 of these being done on the ice. Players should put their strength training gains to use while practicing skills and reduce regular strength workouts to 1-2 per week. Flexibility work should still be done as a ‘loosen up’ in warm ups and as a ‘tension relaxer’ at the end of all workouts. Otherwise, players will start to lose the flexibility gained from off-season training. Less time can be spent on flexibility now. One or 2 repeats of an exercise for each major muscle group should suffice at this stage.

High energy training is difficult to do on ice psychologically because of the combination of intensity and time (very hard for 40-90 seconds) needed. Skills drills are not easily adapted to these training requirements. For this reason, optimum high energy work (60-90 seconds) is easiest done off-ice. Specific high energy work (30-60 seconds/a typical shift length) should be done on ice.

Explosive energy work should be done daily, primarily on ice. This system will be a key to quick skill execution during games.

**Pre-Season
Training
Emphasis:**

- 1) Foundations On-Ice
 - 2) High Energy Training
 - 3) Explosive Energy Training
-

Use the pre-season to finish getting completely physically prepared to play games. All physical aspects of conditioning must be transferred effectively to the ice. Here are samples of pre-season training sessions for both on-ice and off-ice work.

OFF-ICE

Foundations

Aerobic, strength/endurance and flexibility training can be topped up by using the upper levels reached with off-season programs. Emphasis should be on maximizing intensity in aerobic workouts, increasing repetitions in the strength work, and having relaxed, full stretches in flexibility work.

High and explosive energy can be developed by including a drill from each of the following lists of suggestions. These are normally done following aerobic work that will allow the muscles to be very warm to avoid pulls or strains.

High Energy

Keys to high energy training

- Work bouts of 40-90 seconds, totaling 10 minutes of work.
- All out effort (heart rate over 180 beats per minute).
- Take equal or up to double the work time for rest (ratio 1:1 or 1:2).
- Workout 2-3 times per week, allowing 48 hours between sessions.

Sample off-ice anaerobic drills

1. Working in pairs, all out wrestling with partners for a minimum of 40 seconds. Rest for a minimum of 40 seconds. Repeat.
2. Work in pairs again, lock upper bodies and try to throw partner off balance working for a minimum of 40 seconds. Rest. Repeat.
3. Run the perimeter of a gym or field, sprinting all out for a minimum of 40 seconds, jog for 40 seconds. Repeat.
4. Using lines on a gym floor or playing field, start on one end line and sprint to a variety of other lines, returning to the starting point each time. Work for a minimum of 40 seconds. Rest. Repeat.

Explosive Energy

Keys to explosive power training

- Work bouts to a maximum of 10 seconds, totaling 2 minutes of work.
- Explosive, maximum effort each time.
- Work to rest time ratio is 1:5 or 1: 6.
- Workouts 3 to 6 times per week.

Sample off-ice explosive power drills

1. Starting at the bottom of a slope, run up the slope going all out for 10 seconds. Return slowly to starting point. Repeat when fully rested.
2. Using a line on a gym floor or playing field, jump laterally back and forth over the line, exploding laterally each time you jump. After 10 seconds, rest. When recovered, repeat the drill. This same drill may be done jumping laterally over a bench.
3. Starting in the down push-up position, explosively push the body as high off the floor as possible and clap hands together. Do 3-5 repetitions in succession, then rest.

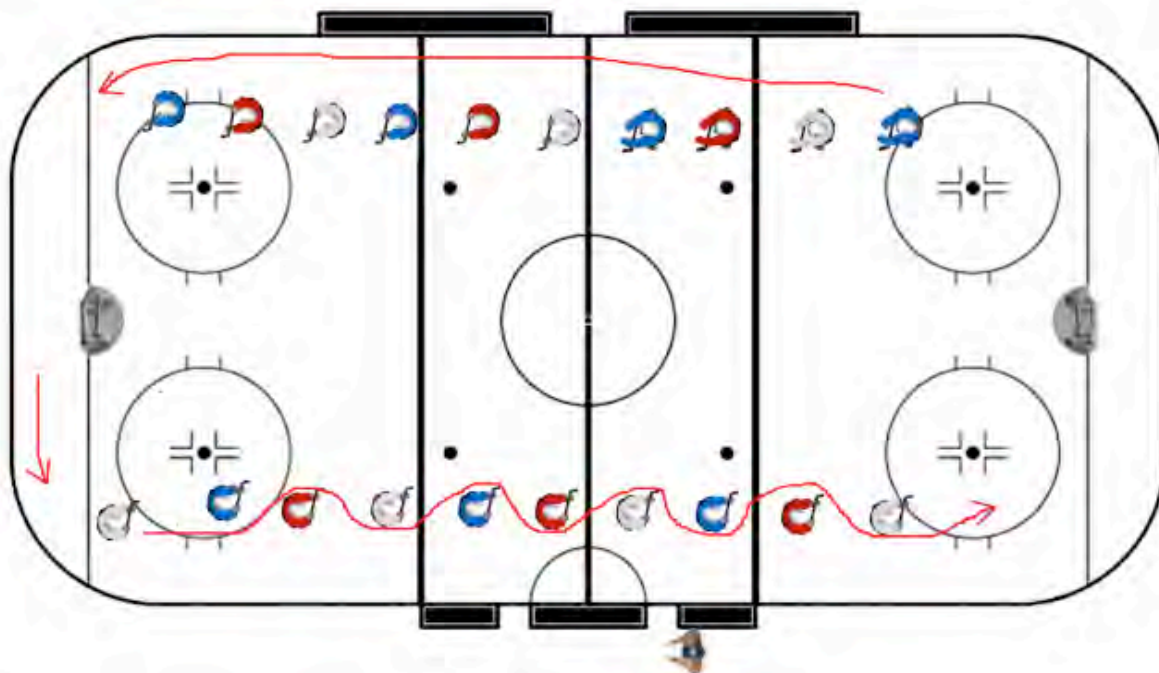
ON-ICE

The same principles used in off-ice conditioning apply to on-ice training. The advantage now is the opportunity for specificity of training. The challenge is to carefully plan drills so that they meet the requirements of training and at the same time working on skills development.

Foundations

Remind yourself of the aerobic, strength/endurance and flexibility guidelines listed in the **Principles of Training** chart presented in Part II-Conditioning. Aerobics can be time consuming and a coach should not commit exclusive practice time to training just this system. The 15 to 30 minute continuous work requirement can be met by additional off-ice work. This can be supplemented by planning a series of non-stop flow drills where skills work is accomplished at the same time as aerobic training. Skills that lend themselves well to such drills include forward and backward skating, skating circles, pylon/ obstacle patterns, puck handling, and passing and receiving work. Remember, avoid line-ups where players are not moving. Rest breaks can negatively affect aerobic training.

Sample on-ice aerobic drills



An Aerobic Sequence for Working on Skating and Puckhandling.

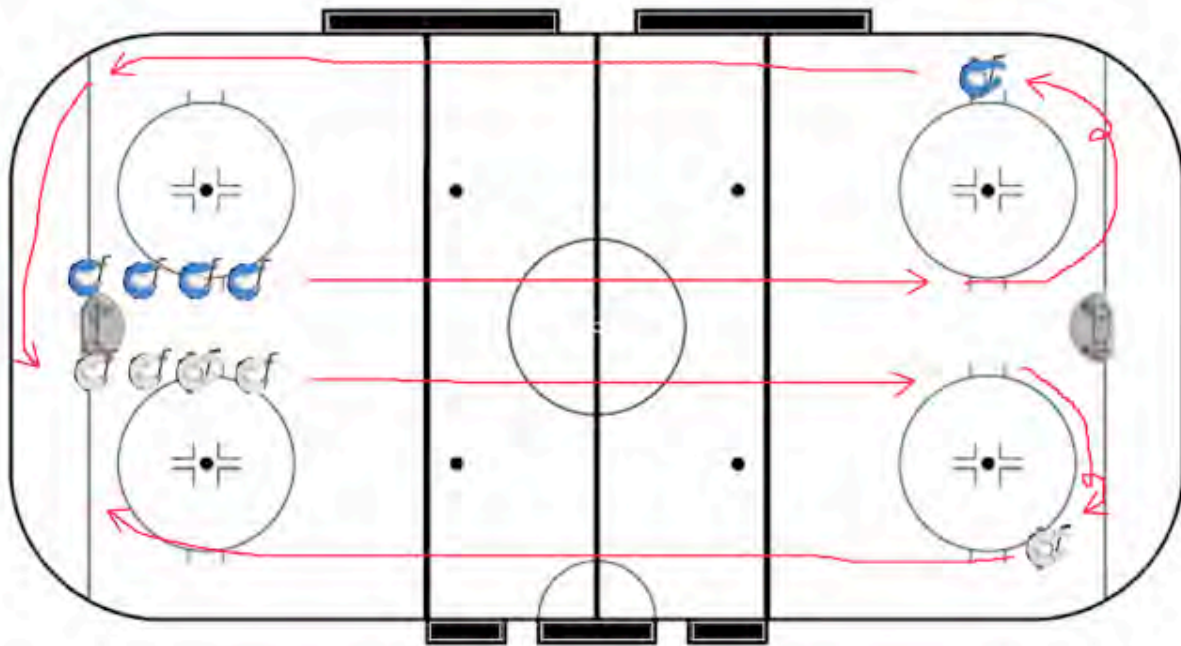
Pattern: Skating the Perimeter

Flow:

1. Players form a single line skating at a moderate pace. The last skater skates all out until he is the lead skater, then he continues at a moderate pace. The new last skater repeats the sprint to the front of the line. Each player gets two turns as last skater to sprint to the front of the line. Repeat in reverse direction. 4 minutes
2. Same pattern. Now the last skater weaves through the line of players skating all out until he is the lead skater. Repeat until each player was last skater twice. Repeat in reverse direction. 4 minutes
3. Repeat parts 1 and 2 above using pucks. 8 minutes

Total 16 minutes

An Aerobic Sequence for Working on Skating, Puckhandling, and Passing,



Passing and Receiving a Pass/Shooting.

Pattern: Down centre and back on sides

Flow:

1. Skaters start in two lines on hash marks at one end of the rink. Using proper heads up skating strides, they skate down the ice, skate below the end zone circle and skate backward to original starting position. Switch lines each time, as all players skate continuously. 4 minutes
2. Working in pairs, players pass a puck back and forth as they skate the center using short passes. Coming back on sides players use longer cross ice passes. 5 minutes
3. Same passes as in previous drill with a shot on goal after neutral zone passing. Each shooter picks up a puck from the corner to continue passing coming back on the sides. 6 minutes

Total 15 minutes

Muscle strength/endurance work can continue being done off-ice. On-ice Circuit training, such as the following, can be designed to be skill specific.

Sample on-ice muscle strength/endurance circuit

Organization: Six exercise stations are designated. There is a station at each of the four end zone face off circles. And the other two are the areas between the center line and each blue line. Each station is assigned a particular exercise. The series begins with an equal number of players starting at each station.

Series: The series starts with each player doing as many repeats as possible of the exercise assigned to the station he is at. The coach blows his whistle at 30-60 second intervals, to start and stop exercise work. The length of time will depend on the conditioning level of the players. Between exercise bouts all players will have 10 seconds to rotate in a clockwise direction to the next exercise station and wait for the coach's whistle to start exercising. The complete series may be repeated 2 or 3 times, particularly if 30 second time intervals are used.

Exercises

1. **Lateral Hops.** (Circle Station) Over circle line using two feet, back and forth as quickly as possible.
2. **Shoot-The-Duck Dips.** (Centre-Blue Line Station) by pushing one stride hard enough to travel the width of the ice while performing one leg squats as you glide. Repeat for other leg on return width.
3. **Twisting Half Sit-Ups** (Circle Station) with knees bent holding shoulders 6-10 in. (15-25 cm.) off the ice. Twist to the left then to the right repeatedly to touch elbows to the ice.
4. **Net Dips.** (Circle Station) are done with the player with his back to a net which is face down on the ice. The hands are placed on the back bar of the net and the elbows extend to lift the player's hips away from the ice; dip back down toward the ice.
5. **Ladder Sprints.** (Centre-Blue Line Station) skate back and forth the width of the ice, going with 1 width sprint, 1 width easy, 2 widths sprint. 1 width easy, 3 widths sprint, 1 easy, and so on up until time is up.
6. **Power Push-Ups.** (Circle Station) which must be done hard enough that the gloves leave the ice at the height of the push-up.

Flexibility is still best done off the ice after practices and games. Warm-up/cool down flexibility can be done on-ice and supplemented as follows.

Sample on-ice flexibility exercises

Note: Proceed by moving *slowly* from position 1 through 6. Pause to relax in the stretched position for 10-30 seconds whenever HOLD is indicated. Repeat the complete pattern at least 3 times.

Flow Pattern:

1. Player starts in a crouch position pressing down on heels to keep the blades flat on the ice. HOLD. Then extend the knees trying to keep the hands on the skates. HOLD.
2. Gradually uncurl the trunk to an upright position by working from the base of the spine up. Continue beyond the vertical to a back bend position. HOLD. Straighten up slowly from this position by working gradually from the hips up the spine. The head and arms should remain limp (heavy) throughout these movements.
3. With hands over head, but limp, bend to the left. HOLD. Slowly straighten up by working from the hip up the spine. Repeat to the right side.
4. Dip to as low a forward lunge position as possible. HOLD. Repeat with the opposite leg forward.
5. Ride the skates to as wide a straddle position as possible. HOLD. Release.
6. Holding the stick behind the back, raise stick as high as possible. HOLD. Release.

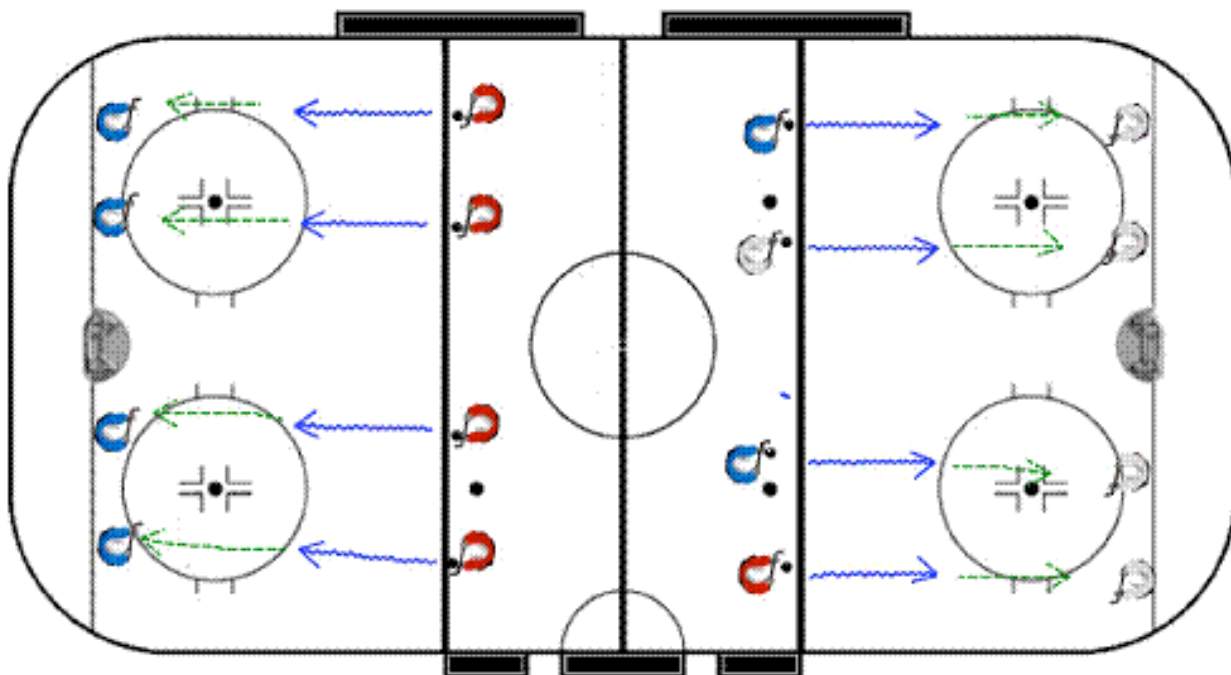
High energy drills can be exclusively for conditioning or done in combination with skills work. Be sure that the skills selected can be maintained at high intensity so that the training effect is not sacrificed.

Sample on-ice high energy drills:

A High Energy Conditioning Drill

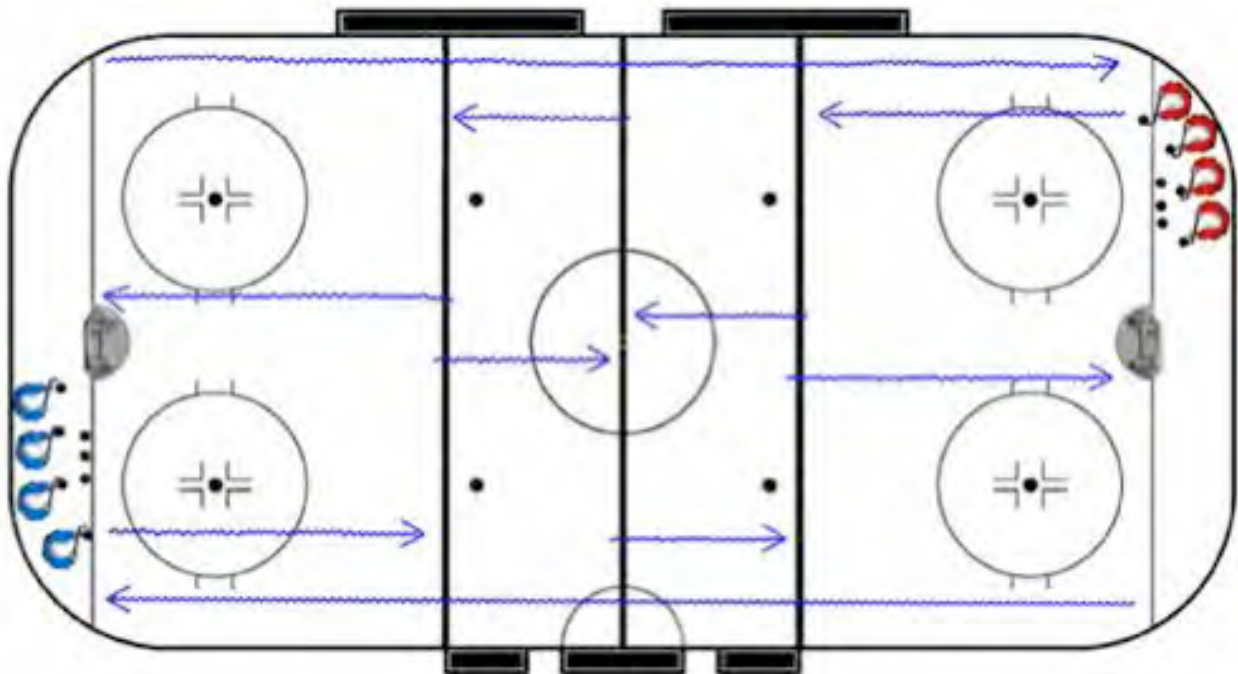
- Skate all out from goal line to blue line to goal line to far blue line to goal line to far goal line. Rest. Repeat.

A High Energy Drill for Working on Passing and Receiving



Zones: Working in pairs, have half the team at the blue lines with a puck. The puck carriers skate in over the top of the faceoff circles, pass the puck to partner on the goal line, then skates backward back to the blue line. Second skater repeats this pattern. This is *all out* effort for 40-60 seconds. Rest. Repeat. All the players are moving all the time.

A High Energy Drill for Working on Skating and Puck Handling



Crossovers: Half the team in opposite (diagonal) corners to start. First skater in each line breaks to blue line-crossovers to center of blue line-skate forward to center line-crossover to boards-break to blue line-break to goal line-crossover to boards. Player then breaks to original line and repeats drill. The next player goes when previous player gets to the first blue line. Rest. Repeat.

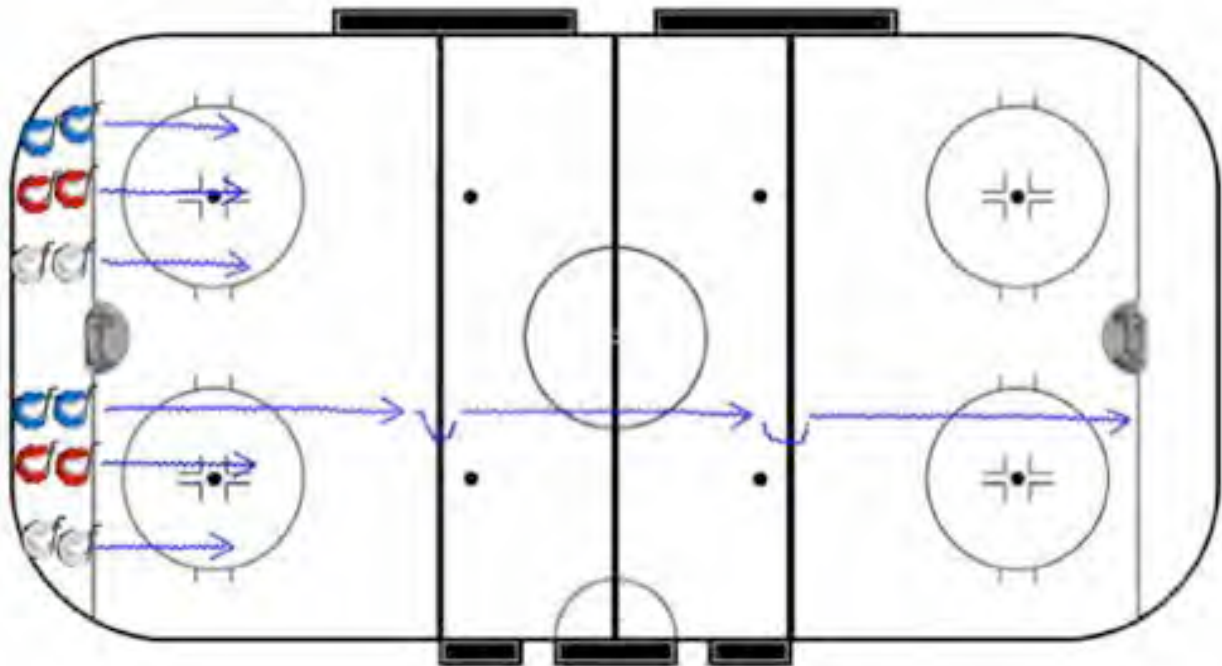
Explosive energy drills can be exclusively for conditioning or in combination with skills work. It is critical that only those skills be used that a player is capable of performing at maximum intensity. Specificity is a key.

Sample on-ice explosive energy drill.

An Explosive Energy Conditioning Drill

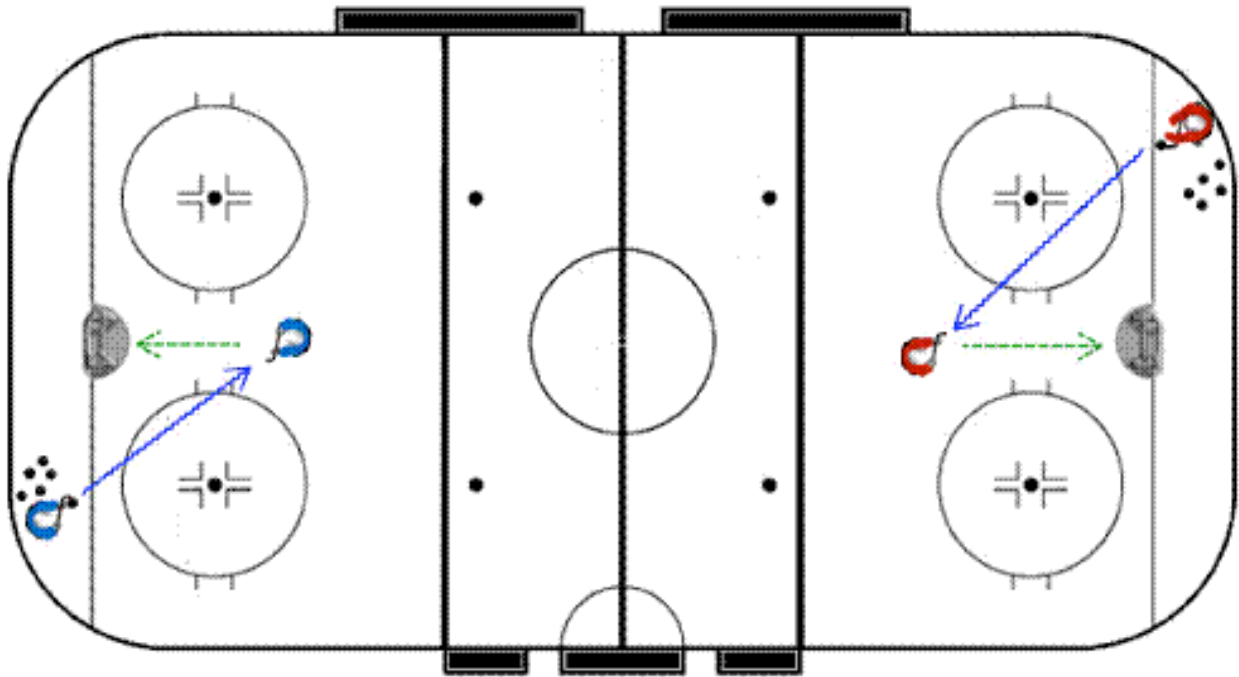
- Start, turn and stop *all out* as you skate from blue line to center line, back to blue line, to far blue line. Rest. Repeat.

An Explosive Energy Drill for Working on Puck Handling



Recovery: Skate the length of the ice as fast as possible with a puck. Players drop to stomach, while maintaining forward motion, and recover quickly to standing, on each blue line. Keep control of the puck all the time during the drill.

An Explosive Power Drill for Working on Shooting



Drill: Pucks and passer in one corner and one shooter in slot area. Passer makes a quick pass from corner to shooter. Shoot quickly on goal. Next pass from corner comes immediately after shot. Continue for 10 seconds then switch shooters. Have passes come from both corners.

Fine tuning for hockey is based on the establishment of a sound physical base and game pace on-ice practice for all speed elements of the game. Pre-season is the time for refining. Concentrated on-ice high energy and explosive power work will help a hockey player's fine tune his game.

IN-SEASON

Games become an important part of each player's weekly routine in-season. Practice sessions often are less frequent when the season starts. Practice emphasis is increasingly focused on drilling skills and team strategies. The result is less time focused on specific conditioning work.

In-Season Conditioning Objectives:

1) Maintenance

No excuses! You've worked hard to physically prepare for the season. Don't carelessly throw away all that you worked for. Some coaches and players continue to believe that a player can get or stay in shape by playing games. This is simply not true.

Conditioning is lost at approximately the same rate as it was gained, if you do not maintenance work. Playing hockey will call on all the physical aspects that you have conditioned.

We know that it takes at least 15 minutes of continuous activity three times per week to condition the aerobic system. To develop, the high energy system needs about 60 seconds of hard, non-stop activity repeated up to 10 times. Every aspect of conditioning has a training minimum.

Take the time to stay in shape. The more games you play per week, the more important this is. The time it takes to stay in shape is minimal, compared to what it took to get in shape. So, go nuts - spend the time!

Aerobic fitness can be maintained at a relatively high level with 1-2 good aerobic sessions per week. Try to use a minimum of two sessions per week to ensure necessary maintenance.

Muscle strength/endurance can be maintained by doing one workout every two weeks.

Flexibility should still be done daily for loosening and tension releasing purposes. Have a thorough flexibility session once every two weeks to maintain a useful range of motion in the muscles and joints. Goaltenders should do extra flexibility work on a daily basis.

A good high energy session should be done once or twice a week. Explosive energy can continue to be trained at each practice. It takes so little time to train, recovery is minimal, and explosive power is so crucial to success in games.

The most important factors are aerobics, flexibility and explosive energy. Aerobic conditioning will allow performance at a high level over an extended period. Flexibility and explosive energy are important because of their role in the speed and safety of the game. Explosive energy is likely called on most during practices and in games.

In-Season Training Emphasis:	<ol style="list-style-type: none">1) Aerobic maintenance2) Flexibility3) Explosive Energy maintenance
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Training in-season should be focused on maintenance sessions. This is assuming you have reached the necessary fitness levels prior to the start of the season. If not, you may find there are not enough practice hours in a day or week to do everything that needs to be done. Concentrate on aerobics, flexibility, and explosive energy, regardless of the fitness levels. The game cannot be played well without these.

Following are some suggested programs for in-season conditioning maintenance.

Sample In-Season Training Programs

Off-Ice

- Aerobics is still the foundation for training. A good practice will usually have an aerobic drill package built in. Cycling and running are two common ways to do aerobic work off ice. Skiing, both water and snow, is excellent for hockey players because it includes upper body work.
- Flexibility should be done daily with emphasis on proper warm up/cool down stretching before and after practices and games. Add at least one weekly flexibility training session.
- Explosive energy can be done as outlined in the pre-season section. You can also incorporate stair sprints (2 steps at a time), or stair hops (up and down) using one leg only for each 5-10 second work bout.

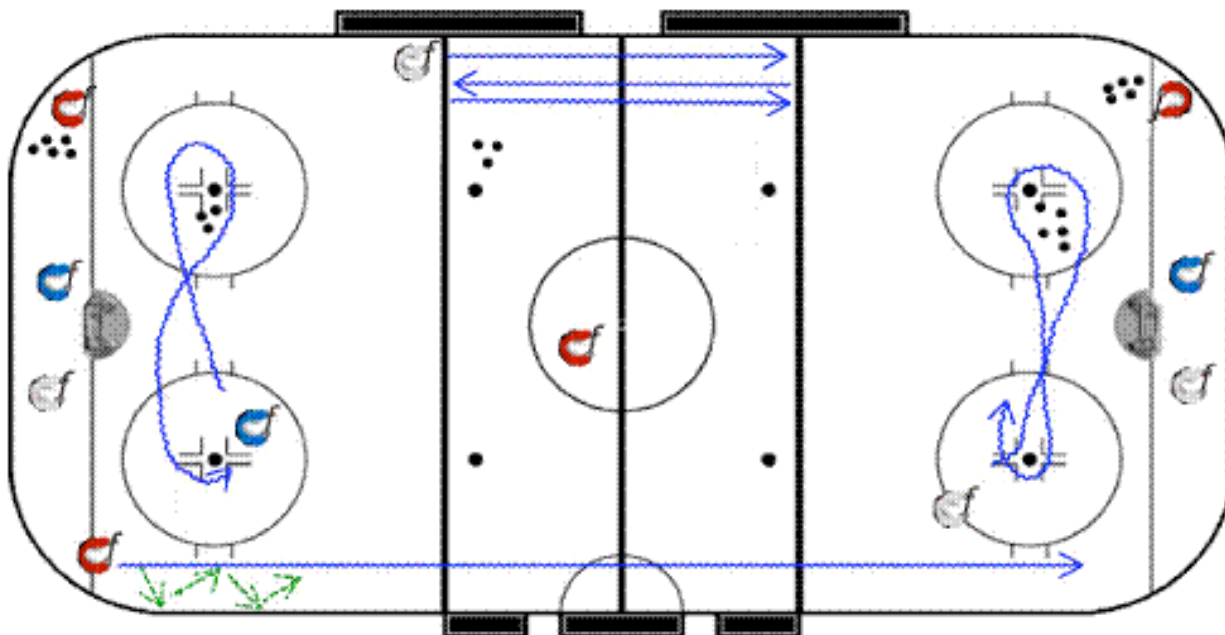
- Maintenance of strength/endurance and high energy can be accomplished by exercising at least the level attained in the pre-season. If a player's ability to sustain high energy is still weak, players will need to do additional training. Continue to do high energy training 1-2 times per week, depending on game schedule. High energy work should not be done the day prior to a game. Try to do at least one of the two sessions on the ice.

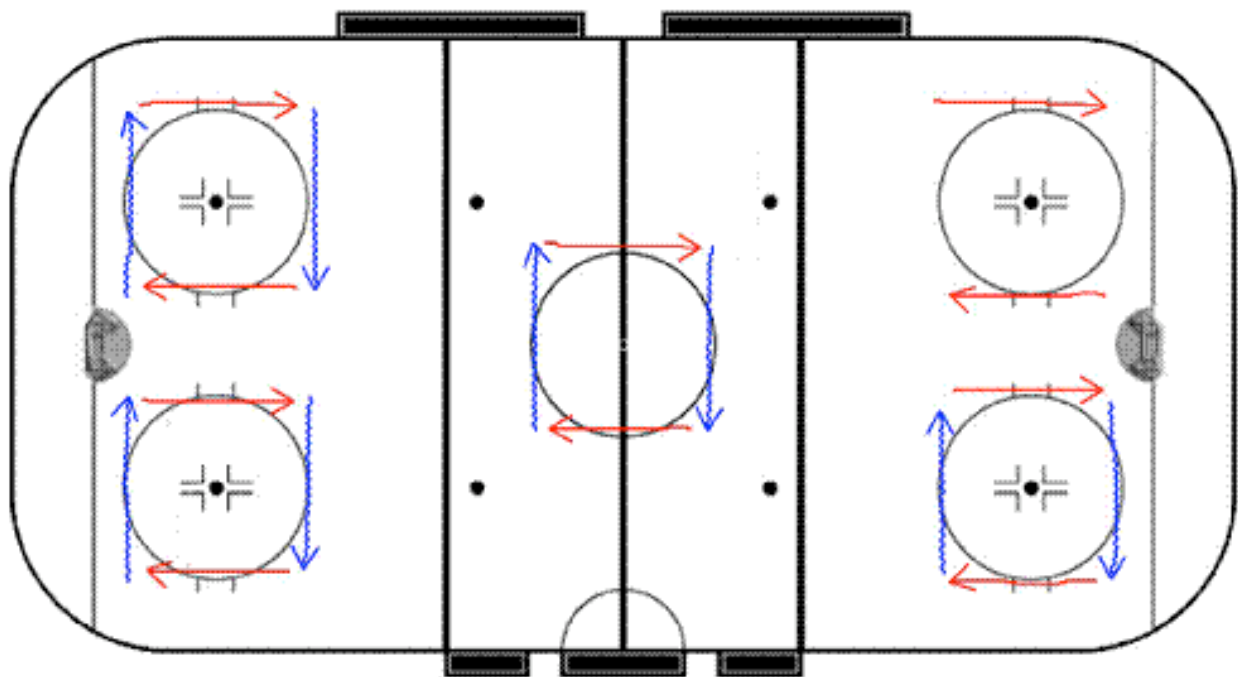
On-Ice

All aspects of conditioning should be done *at least* to the level attained in pre-season work using programs and drills as outlined in the pre-season section. To save training time, or for variety in training, exercise circuits can be designed to meet all components of conditioning, except flexibility.

Flexibility should be done separately before and after workouts. A complete on ice training circuit is presented below.

Sample on-ice multi-purpose training circuit;





Organization: Explain the 10 exercise stations. A diagram at each station makes this easy. Explain the format for station 11. Begin with all skaters doing laps. On the coach's command skaters will go immediately to a pre-arranged starting station illustrated in diagram (a) (maximum 3 players per station). Repeat the exercise at each station for one minute. The coach blows his whistle after 1 minute. Players immediately proceed to the next station. Work through the ten stations in numerical order, regardless of the starting station.

At the completion of all 10 exercise stations all players go to one of the five box areas illustrated in diagram (b) (maximum 5 players per box). This is station 11. Perform the exercise as described. Finish the circuit with a few easy laps as a cool down.

Exercises

Skate the perimeter

- Sequence: 2 laps easy
- 3 laps medium pace, reverse direction
- 4 laps strong pace

Proceed through stations (one minute at each):

1. **Forward Figure 8 skating with a puck.** Use strong pace and tight turns.
2. **Twisting Tuck Sit ups.** Start in a sit up position with hands behind head. Curl up to a tuck position twisting to touch left elbow to right knee. Return to starting position, then repeat touching right elbow to left knee.
3. **Blue Line Shuttle.** Start with a puck on the blue line. Skate as hard as possible three times from blue line to blue line, using starts and stops, stopping both to the right and left (face the boards on each start and stop). Skate easy for two widths and repeat the sequence.
4. **Power Push-Ups.** For 10 seconds perform power push-ups hard enough that you can tap the chest with both hands at the height of the push-up. Rest for a count of 10. Repeat this sequence for one minute.
5. **Backward Figure 8 skating with a puck.** Use strong pace and tight turns.
6. **Back Leg Lifts.** From a front lying position, raise the legs as high off the ice as possible, hold, then lower back to the ice. Keep the legs straight.
7. **Board Passes.** Skate hard the length of the ice, passing and receiving the puck off the boards alternating forehand in one direction and backhand in the other direction.
8. **Net Dips.** Sit straight legged holding the edge of a net that is lying front down on the ice. Lower hips to the ice, then return to an extended elbow position.
9. **Quick Feet.** Starting in the center of the circle, quickly skate forward to the top of the circle, then backwards to the center, then laterally to the right side, laterally back to the middle, backwards to the bottom, forward to the middle, laterally to the left side, laterally to the middle, forward thru the top. Keep rotating skaters for one minute.
10. **Explosive Energy Shooting.** Using one puck, do 10 fast repeat wrist shots into the corner boards. Concentrate on speed, accuracy and control of rebound shots, whether forehand or backhand. Rest for a count of 10. Repeat.
11. **Box Skate.** Skate all out 3 times in each direction. Skate the perimeter of the rink easy for one minute. Repeat sequence 3 to 6 times.

You worked hard to reach your present level of conditioning. The key to in-season training is to maintain this level. Maintenance takes less time than development and there definitely be work involved. Do not count on games to do the job for you.

POST-SEASON

It's the end of the season. The last regular season or playoff game buzzer has sounded. Now the post-season begins. The length of the post-season may vary from a few days to several weeks. It will last until you start regular training again.

Post-Season Conditioning Objective:	1)A Mental and Physical Health Break 2)Rehab Injuries
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The post-season is the time to unwind and let the mental and physical effects of a long winter of practices and games drain out of your system. The mind will appreciate a change in focus and likely be happy to take a mental health break from hockey.

Your body needs to repair the wear and tear it went through over the course of the season. You may have some injuries that need to be attended to. Be sure to work with your doctor and medical trainer to assure proper care. Identify all medical issues and work with medical staff to address each issue properly and completely.

During most 'mental health breaks' there are various activities that may cause you to slip from the fitness levels you attained during the season. Activities like eating and drinking habits, inactivity, lack of regular workouts, low motivation, and no one to monitor your training can all work against you. Don't let such activities take control.

Post-Season Conditioning Emphasis:	Complete Recovery
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The key to an effective post-season is to get a complete mental and physical change that lets the mind and body recover totally from the season. A definite attempt should be made to minimize a back-slide in fitness while facilitating recovery. Otherwise the job of training in the off-season will be much more difficult. Players should feel a commitment to staying fit. Training should become an important part of a player's daily routine.

Not all training has to be done at the intensity of pre-season and in-season workouts. Fitness is a road to good health regardless of athletic status. Staying active daily will help you control fitness levels and weight issues.

Following are some tips for break activities during the post-season.

- Relax and holiday aerobically. Plan hiking trips and bike excursions with family and friends. Find a camp or cottage near a beach where you can take long walks or do some light jogging daily.
- Pick up a different sport for recreation. Soccer is an excellent post-season and off-season sport. Golf, hiking, swimming, the martial arts, and any of the racquet sports are also good alternatives.
- Use a pay-up system to keep weight in check. When you know you have consumed more than what you needed, estimate the extra calories and pay-up with a corresponding amount of extra activity. For example, a bottle of beer is cancelled out by approximately 30 minutes of walking or 8 minutes of running or 18 minutes of cycling.
- Relax, have fun and get a change of pace mentally and physically.

SUMMARY

Hockey is a sport that requires commitment year round, if a player expects to develop. The game is too demanding to try to cram all the necessary conditioning work into the playing season.

The year can be divided into four training periods: **off-season**, **pre-season**, **in-season**, and **post-season**. Each season has different conditioning objectives and conditioning emphasis. These are based on what needs to be trained and the demands on players during a particular training period.

The **off-season** is the time to build physical foundations and eliminate physical weaknesses. Emphasis is on aerobics, strength training and flexibility. It is also the time of year that special training concerns are best addressed.

Later in the off season, high and explosive energy systems will start to be trained.

Pre-season is typically training camp time for players and teams. Topping up aerobic and strength programs will be a priority. This is also the time of the year where training is transferred to on ice performance.

Training emphasis switches to high and explosive energy training.

In-season the training emphasis is on maintenance. Coaches have to design on-ice and off- ice workouts to eliminate any loss in conditioning levels.

Post-season is the time for players to recover from a hectic season, focus on injury rehab and get a mental health break after a long hockey season.

Specific sample training programs are provided for each season. Programs incorporate training principles and focus on the conditioning requirements for each season. These programs can be modified to suit individual needs, facilities available and individual exercise preferences. In every situation, training principles and seasonal objectives need to be maintained.

APPENDICES

A. Age Adjusted Target Training Heart Rates

B. Other Resources

Appendix A

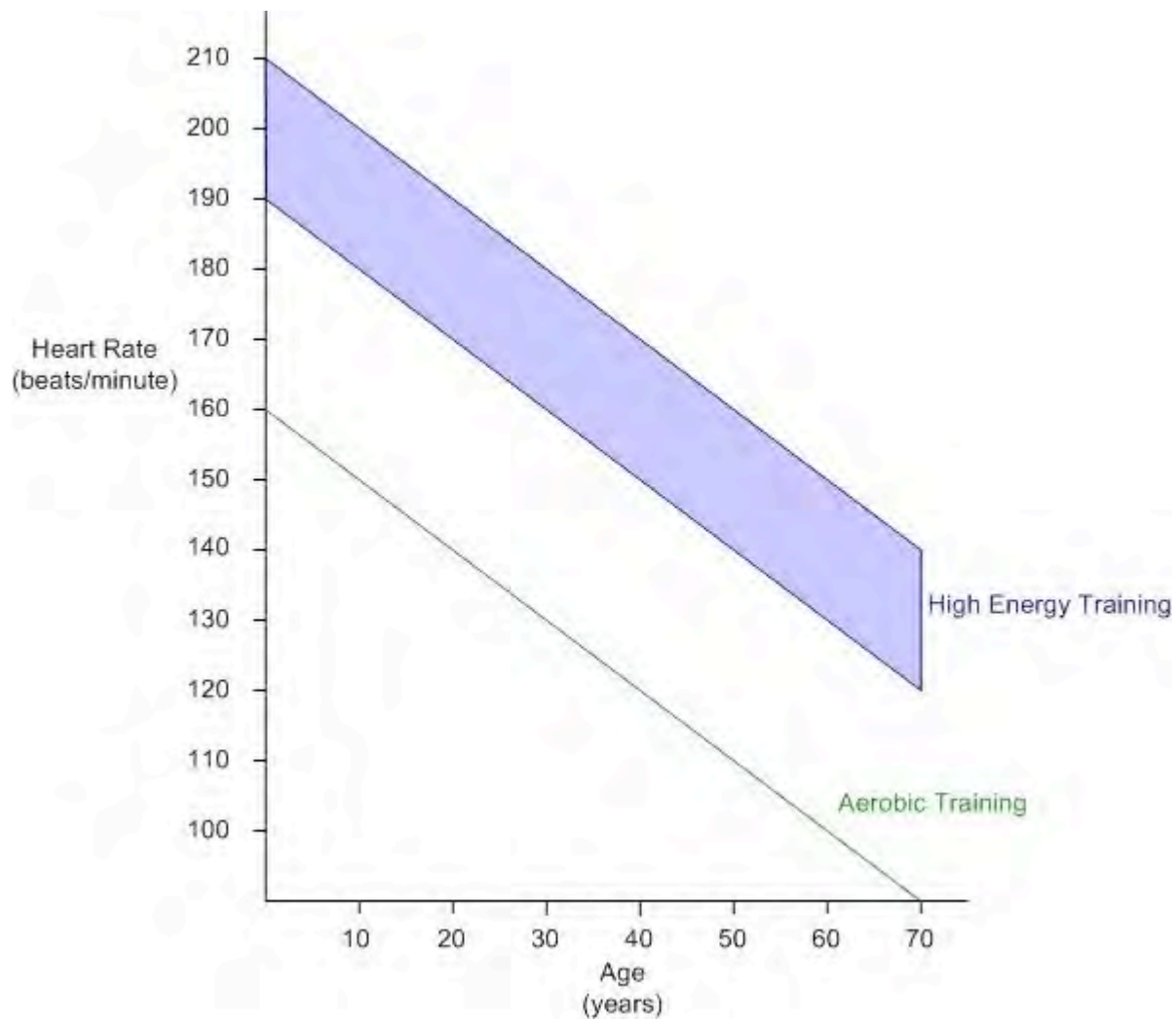
Age Adjusted Target Training Heart Rates

Appropriate target training rates decrease with age. The rule of thumb to follow in determining your target heart rate is as follows:

Aerobic - start training at 170 minus your age, work up to 200 minus your age.

High Energy - start training at 200 minus your age, work up to 220 minus your age.*
See chart below.

*CAUTION: This level of training is very stressful for the untrained or developing young hearts and on out-of-shape old hearts. Progress towards this level should be VERY gradual, and may not be recommended for some individuals.



Appendix B:

Resources

Here are a couple of other books that Gail and Don have written in the area of hockey conditioning.

52-Week Hockey Training

With ***52-Week Hockey Training*** you find:

- Yearly training plans

- Monthly practice and game sessions
- Weekly training plans
- Daily practice plans
- Individual team and player training programs
- Specific programs to meet your specific needs and concerns

Here are a couple of quotes from professionals who have used ***52-Week Hockey Training***:

"This is a great reference for helping both a player and a coach design an effective fitness program that meets the specific demands of playing hockey."

Dave King- former NHL head coach with the Columbus Blue Jackets, Calgary Flames and also Canada's National team head coach.

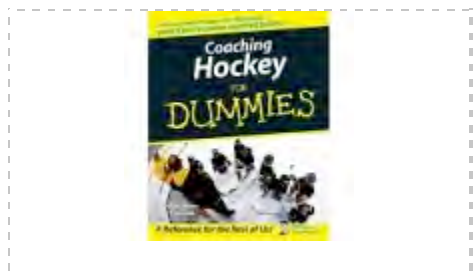
"Half the battle of conditioning is staying motivated, especially in the off-season. Don and Gail's program will help you keep your focus and meet your conditioning goals all year long!"

Shjon Podein- former NHL player with the Edmonton Oilers and Stanley Cup winner with the Colorado Avalanche.

Click on the link above to get your copy of ***52-Week Hockey Training***.

Another book by MacAdam and Reynolds:

COACHING HOCKEY FOR DUMMIES



It is a user friendly and fun way for coaches, players, parents, and fans to learn more about coaching hockey, and learn more about the game of ice hockey in general.

The book will give new and experienced coaches information on all the topics they will encounter over the course of a season. There are tips on yearly planning and goal setting, practice planning and designing drills for skill development.

The book gives players insight on team play and how to improve individual skills.

Parents and fans can browse through ***Coaching Hockey for Dummies*** to better understand what the coach is trying to accomplish during practice sessions and games.

Click on the link above to get your copy of ***Coaching Hockey for Dummies***.

About the Authors

Don MacAdam

After thirty-plus years of hockey experience that spans the globe, Don MacAdam is an inexhaustible resource for hockey information. He has played, coached and owned and operated a professional hockey team. He has been a general manager, a scout and a mentor for developing coaches. He has written hockey coaching and training books and association coaching manuals and he has made presentations to thousands of coaches through conferences and workshops. Don coached in North America (in the NHL, AHL, ECHL, university and major junior hockey), in Europe and in Asia (in the Japan Ice Hockey League). His recently launched hockey web service www.hockeysensei.com provides limitless resources for hockey coaches, players and corporations looking for unique sports-based speakers.

Gail Reynolds

Don's co-author, Gail Reynolds, is an exercise physiologist who designed and conducted training programs for athletes and teams in a variety of sports and at competition levels ranging from amateur, to college, to professional and wheelchair. She has accumulated thirty-plus years of experience as a professor at the University of New Brunswick in Canada, a research scientist at the famous Karolinska Institute

in Sweden and a private fitness and training consultant for ACTIVentures. Gail has written a variety of books and articles on fitness and training, particularly in the area of training for hockey.