

# INPUT

**OIRA**

ONTARIO INTRAMURAL RECREATION ASSOCIATION

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## AEROBIC EXERCISE PRESCRIPTION

Hippocrates Said It Best: "That Which Is Used Develops, And That Which Is Not Used Wastes Away."

Regular aerobic exercise in the form of cross country skiing, swimming, jogging, cycling, rowing, walking, and "aerobics", causes many changes in the body and mind.

The primary adaptation to aerobic exercise is improved delivery of oxygen to the muscles. This is accomplished due to changes in the heart, blood vessels and blood. Aerobic activity increases blood volume and raises the level of oxygen-carrying hemoglobin in red blood cells. With myocardial hypertrophy, the heart becomes capable of ejecting greater amounts of blood with each beat, or "stroke". This increase in stroke volume results in fewer heart beats being needed to circulate a given amount of blood, and helps to explain why endurance athletes typically have low resting heart rates. But their maximal heart rate does not change and therefore the increased stroke volume provides more oxygen during strenuous exercise.

Changes also occur in the cells of the skeletal muscles that are involved in the exercise, giving them a greater capacity to use oxygen. There is increased oxygen-extrac-

tion capabilities due to a greater amount of myoglobin and an increase in oxidative capacity due to more mitochondria being produced.

The improved delivery and use of oxygen result in increased energy production, which in turn supports muscular contractions for better endurance performance.

The adaptations that contribute to increased oxygen delivery occur regardless of the type of aerobic exercise performed. But because oxygen use occurs at the cellular level, only the muscles involved in the work-out will improve their efficiency. This is the basis for task specificity.



Increased lung volume, enhanced movement of oxygen from the lungs into the blood and the ability to breathe more air per minute all occur with regular aerobic exercise, but these changes do not guarantee improved performance. Even very strenuous aerobic exercise uses far less than the lungs' maximum effort. Thus, becoming "winded" during activity is caused more by cardiovascular inadequacy than by lung inefficiency. However, because trained muscles use oxygen more efficiently, less breathing is necessary. When the muscles used in breathing aren't used as often, they require less oxygen, freeing more oxygen for the exercising muscles and improving endurance.

Orthopedic changes that occur with regular aerobic exercise include stronger ligaments, which bind bones together at joints, stronger tendons, which attach muscles to bone and thickened cartilage which helps bones fit together at joints. These changes occur mostly with weight-bearing aerobic activities such as cross-country skiing, running and "aerobics".

Although the psychological effects of aerobic training are still under investigation, evidence does suggest that aerobic exercise can improve mental outlook and self-image, reduce anxiety and tension and increase self-discipline and motivation.



The Ontario Intramural Recreation Association acknowledges the financial support of the Sports and Fitness Branch of the Ministry of Tourism and Recreation.

# Secondary School Contributing Editor Jennie Hood, Scarlett Heights Secondary School

## AEROBIC

(Continued from page 1)

In order for a fitness program to be successful, the exercise prescription must mesh physical needs, lifestyle demands and fitness interests/goals:

a. **Physical Needs** – determined from fitness tests - eg. Canadian Standardized Test of Fitness using an aerobic "step" test or in a large-group secondary school Cooper's Twelve Minute Run

b. **Goals** – includes fitness interests - eg. type of aerobic activities preferred - specific expectations and objectives with regard to aerobic improvement

c. **Lifestyle Demands** – things to consider are time available to work-out, part time job/studies, location preferred, pattern of participation (individual or group)

Each exercise prescription is a blending of these three factors to produce an individualized program which will motivate the participant. It must include specific instructions for the type, intensity frequency and duration of exercise.

### AEROBIC EXERCISE INTENSITY INDICATORS

The aerobic training intensity threshold is 50% of Maximum Oxygen Uptake – below this intensity will burn fat but won't result in improved cardiovascular endurance

- % Maximum Oxygen Uptake (% VO<sub>2</sub> Max)**
  - training range most often used is 60-70% (50% + for poorly conditioned subjects)
  - the most accurate indicator
  - impractical for high school use as monitoring equipment (expired gas collector/analyzers) required

- % Heart Rate Reserve (HRR)**
  - ranges used are 60-90% for continuous work
  - a specific target heart rate (THR) is given to the participant

#### Steps for Aerobic Prescription

- Frequency**
  - less than 2 sessions per week will not produce a training effect
  - 3 sessions per week (48 hours apart) for a reasonable training effect for *beginners*
  - 4-6 sessions per week for optimum improvement and for advanced trainees. Participants interested in improving CV fitness should do not more than 5 sessions per week in order to prevent the risk of overuse injuries



- Intensity (By Heart Rate Reserve – HRR)**

	Target Intensity	Minimum	Do Not Exceed
Beginner	60% HRR	40% HRR	75% HRR
Average	70% HRR	60% HRR	85% HRR
Advanced	80% HRR	70% HRR	90% HRR

\*60% HRR beginner intensity may be too low for young or very slim participants.

\*\*After warming up, allow 2 minutes to achieve a steady state before a pulse check.

- Time (Duration and Progression Rate)**
  - progression is dependent upon health, age, functional capacity

and the type of activity (impact or non-impact)

- aerobic conditioning has three stages regardless of fitness level: initial, improvement and maintenance

\* *initial stage* - 4-8 weeks

- for good to high aerobic fitness levels, the initial stage may be shorter than 4 wks

- relate starting point to aerobic testing

- 12-15 minutes duration and perhaps increasing to 20 minutes by the end of the initial stage

\* *improvement stage* - 6-8 wks

- 6 mos

- the majority of aerobic improvement can be made over 6 months

- sessions increase to 20-30 minutes for the average subject

- duration may be safely increased by 5-10% every 2-3 weeks for trainees under 30 years old

- sessions exceeding 30 minutes increase the incidence of injury

\* *maintenance stage* - beyond 6 mos.

- aerobic goals may have been attained by this point

- frequency can be reduced to three times a week

- intensity can be dropped to the minimum training threshold of 60% HRR (50% VO<sub>2</sub> max)

- duration will be maintained between 20-30 minutes

- a variety of activities should be used to prevent boredom

- Type of Training (Specificity)**
    - aerobic training gains are specific to the activity used
    - although the heart can be trained by different activities, improvements are specific to the muscles used (eg. running has little carry-over to swimming training because the blood-
- (See AEROBIC EXERCISE, page 3)

# AEROBIC EXERCISE

(Continued from page 2)

delivery network hasn't been developed)

- the quickest improvement gains are made with activities that involve the largest muscle mass, usually the legs

## 5. Detraining Effect

- significant loss occurs after 2 weeks of ending training
- 50% improvement loss after 4-12 weeks of ending training
- near 100% reduction after 10-32 weeks of lay-off depending on the individual

With the aerobic testing completed, a counselling session held to determine fitness interests and goals, and lifestyle demands, an aerobic prescription developed, it is useful to be able to give the participant an aerobic exercise form which

should be discussed and clarified prior to beginning the program.

With group testing and a small expenditure of time for individual counselling and program design, it is very easy to involve many students in personalized and meaningful fitness experiences. Many of these students might not take part in the usual games, leagues, and special events associated with Intramural programs. Individualized fitness programs extend the Intramural program and give meaning to the adage "fitness for life".

- resources - The Physician and Sports Medicine, vol. 11 no. 9, Sept. '83.

- Exercise Prescription Course - Humber College

- Essentials of Fitness by Falls, Baylor & Dishman. Saunders College: Philadelphia. 1980

## You Know You Need A Workout When . . .

You walk past a cemetery and two guys with shovels come running after you.

You are at the zoo and kids start feeding you peanuts.

You go to a horse show and win.

You go swimming and get hit by a harpoon.

You get stuck between the "Golden Arches."

Your photographer needs a wide-angle lens.

Your office chair has developed stretch marks.

You go to a weight reduction program and the instructor immediately orders a new Mercedes.

You get winded playing "Pac-Man".

You go sky-diving and the parachute doesn't slow you down.

Your idea of aerobics is heavy breathing.

The chair gets up when you do.

Your insurance agent offers you a group rate.

You're on top of the Empire State Building and planes start to attack you.

Your designer jeans are by Orson Welles.

You stand in front of a Micro-Wave oven and yell "HURRY".

You're lying on the beach and two guys from Green Peace try to throw you back in.

## Final Issue - Editor's Note

The Editor position has been a creative one for me and I have very much enjoyed working on the past issues. I do remember telling Brian Cressman (OIRA's very first Editor) that I couldn't do it alone the way he was able to, and so I conscripted three excellent writers - Meg Innes at York University, Jennie Hood at Scarlett Heights Secondary School and Dave Schlei, Consultant for the Waterloo Board. For the last 25 issues they have presented the OIRA members with a wealth of information and have continued to be a great support group to me as Editor. Thanks very much for a job well done!

The printing and the setting up of the articles have been handled by Hvratski Put's Rudy Tomic who has created reader visual interest as well as having met deadlines and given us a well designed and printed newsletter.

All these people have made the newsletter fun to work on, however, it's time now to share the role of Editor with another, and it is with best wishes that I pass on the position to Pat Finch - Vice-President, Publicity.

Jean Kennedy

Lost members: Please send Pat Finch any information so that we can send the newsletter to their correct address

Mr. and Mrs. John Mistele

J.W. Lavigne

Jeff Girdlestone

Ian Bowers

Rebecca Hunter

A thought for today -

*"When any new ideas are around, there are those who wave the red flag, and there are those who wave the wet blanket.*

*There can be no possible doubt which is the right thing to do.*

*It is always a sin to discourage enthusiasm."*

- William Barclay

# Post Secondary Contributing Editor Meg Innes, York University

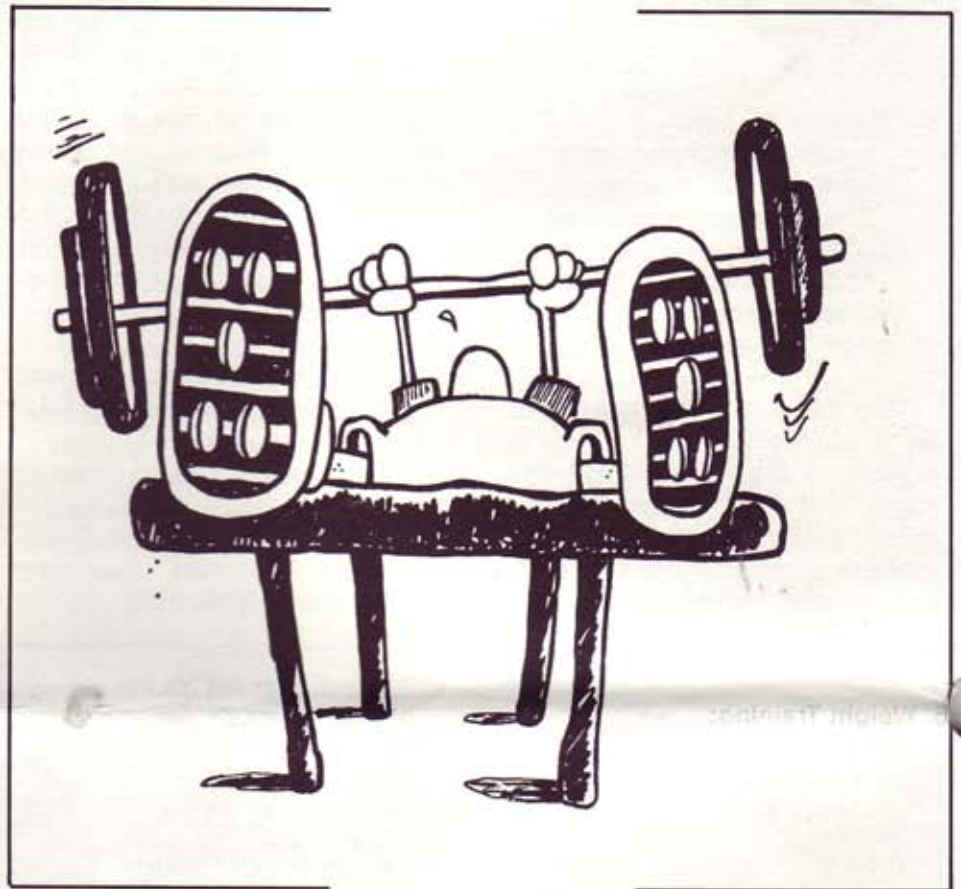
## FITPRINTS' Guide to Getting Fit for the Summer

It's finally here! Just when you thought you couldn't look at those salt-stained boots one more time. (They used to be black didn't they?). Right when you knew you couldn't possibly afford to replace one more pair of gloves; just when you swore that having to face another cold, grey, blustery winter day would cause you to lose it entirely, Spring has arrived! Glorious sunshine and warm breezes announce its long overdue arrival to us in a manner implying 'I knew you could wait for me'.

Its presence sets us aglow as life is renewed all around us. However, the promise of summer following close on its heels is enough to send many of us into a tizzy of anxious participation and panic. Bathing suit season will be here before we know it. Shorts will supplant our long skirts and pants as sleeveless tops replace our concealing winter turtle-necks and sweaters. For many, these thoughts will send them tearing to their local gym determined to work off those extra 5 or 10 pounds gained during the months of winter. For those who are anxious to rediscover and tone up those evasive muscles... (I think I saw them last October) ... here is FITPRINTS' GUIDE TO GETTING FIT FOR THE SUMMER.

### 1. Don't Expect Miracles:

Realize that those extra pounds that took you six or seven months to accumulate are not going to disappear overnight. To lose excess body fat and tone those sagging muscles, you need to make a commitment to yourself to exercise regularly and to continue exercising even after your goals are achieved. (Its surprising how fast all the results of your efforts will disappear once you stop working out).



### 2. Diet Sensibly:

The best diet is a sensible one. Fad diets are not the route to take. You may experience a quick initial weight loss on fad diets but more often than not the loss is primarily water loss. Gaining it back (plus some more) is not uncommon when you indubitably return to your old eating habits.

### 3. Consult a Professional:

If you are unsure which route to take on the road to a flat stomach and tight buns, consult a fitness professional. There are many different types of exercise. Together you can discuss your goals, your lifestyle and your likes and dislikes before mapping out the plan of attack that will work best for you.

### 4. Don't Overdo It:

Probably the most common mistake made when starting a new exercise program is the tendency to go all out in an inspired and heartfelt effort. While one's intentions are honourable they will often result in a certain degree of incapacitation due to extreme muscle soreness and in some cases injuries.

It is best to start out at an easy pace, increasing gradually as your muscles adjust to the new strains you are imposing on them. This may seem too slow and boring at first, but in the long run you will be further ahead having avoided injuries and muscle soreness.

(See FITPRINTS', page 5)

# FITPRINTS' Guide to Getting Fit for the Summer

(Continued from page 4)

## 5. Cardiovascular Fitness:

Remember to include a cardiovascular (also known as aerobic) exercise component in your exercise program. The most important part of any program, cardiovascular exercise not only improves the fitness of your heart and lungs, it also burns calories at a high rate helping you to lose that extra weight.

You should be aerobically active three times per week for 20 minutes or more each time. Try to elevate and maintain your heart rate in its target zone for the duration of the aerobic exercise. (This does not include the warm-up and cool-down time). Here is a simple formula to predict your heart rate target zone:

$220 - \text{age} \times 65\% = \text{lower limit}$   
(beats per minute)

$220 - \text{age} \times 85\% = \text{upper limit}$   
(beats per minute)

## 6. Weight Training:

If you decide you want to use weights in your exercise program, it is important to observe these basic rules:

(i) Always allow a day of rest between lifting sessions. If you wish to weightlift daily see your instructor and ask them for a program which works different muscle groups on alternate days.

(ii) Exercise large muscle groups before the smaller muscle groups and allow sufficient rest time between exercises for the same muscle groups.

(iii) Antagonistic or opposing muscle groups should be worked one after the other.



Avoid doing two exercises for the same muscle group in a row (when you are starting out).

(iv) Breath out on the exertion phase of each exercise and breath in on the relaxation or release phase.

gram). All stretches should be static (no bouncing) and each one should be held for 10-20 seconds. Perform each stretching exercise 3-4 times.

### Variables for Program Design:

Goal	Reps.	Sets	Load (Wt. % of max.)	Rest Interval
Strength (bulk)	1-4	4-8	85-100	2-4 mins.
Power	5-10	3-6	70-80	1½-2 mins.
Muscle Endurance	15-20+	2-4	50-70	45-90 secs.

## 8. Have Fun!

Working out should be enjoyable. For many it is looked upon as a necessary evil, but this does not need to be the case. Find some form of exercise which you enjoy. Put aside special time in which to do it and maybe even find someone to do it with. Together you can look forward to those fabulous results.

## 7. Stretching:

Stretching should be a part of every program in the warm-up and cool-down phases. You should stretch all major muscle groups (especially those which you will use in your exercise pro-

Catherine Maron-Brown

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# Secondary School Contributing Editor Jennie Hood, Scarlett Heights Secondary School

## A VIEW FROM THE ADMINISTRATIVE SIDE

For 1 month I had the opportunity to be a full-time Acting Vice-Principal and I would like to share some of my insights which might be useful to Intramural Staff Advisers.

A typical day for a V.P. is characterized by brief encounters, frequent interruptions and lots of "loose-end" situations which must be worked with on a continual basis. In this milieu, it is sometimes difficult to keep track of all the "threads" – one of which is the Intramural program.

The Intramural Staff Adviser can really develop a useful, important and ongoing role for the V.P. by:

a. inviting the V.P. to drop into the gym during the lunch hour as part of his/her cafeteria and hall patrol. While there, introduce a few of the student leaders and take the time to explain what is going on in the gym.

b. speaking to the V.P. about the Intramural program - its goals, needs, support etc. Ask to have the V.P. create "air time" for you to address the Heads of Department, Teaching Staff, Grade 9 Parents, Grade 8 Students regarding the Intramural Program.

c. asking the V.P. to officiate special events – he/she may initially need a written invitation and an informal reminder.

d. inviting the V.P. to an Athletic Council meeting to learn "first-hand" what goes on. After an initial exposure, ask the V.P. to present a mini-workshop to the Council members on some aspect of leadership.

e. giving the V.P. a calendar of all the important Intramural dates and discussing with the V.P. how he/she might be able to assist.

f. having the V.P. involved in Intramural awards presentations

g. asking the V.P. to call down and congratulate Intramural participants/student leaders for such things as - good sportsmanship, outstanding play, co-operation, good



refereeing, well-run activity.

\*V.P.'s often deal with students in difficulty and the perception of students is that they get called down to the office because they're in trouble.

The above suggestion (modified from one presented by Chris Hardess from Central Etobicoke High School) gives the V.P. a very positive student-focused role.

As mentioned earlier, the typical

day of the V.P. is extremely disjointed. Rather than complaining about the fact that the Administration doesn't care about the Intramural program, an Intramural Staff Adviser should be cognizant of the nature of the V.P.'s job and develop an effective strategy to invite and encourage Administration awareness of and involvement in the Intramural program.

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### Dear Doctor Gord

Dear Doctor Gord

I have a problem with athletes. Almost every Intramural Activity is dominated by school athletes, especially boys, and it turns off a lot of the kids who wish to participate. How can we give everyone a fair chance without turning some people off?

Signed  
Intimidated

Dear Intimidated

Well, you won't be able to please everyone but how about making

variations to the rules of your games, so as to take the advantage away from the dominant athlete.

Examples:

- boys can't spike or serve overhand in co-ed volleyball
- boys can't go in the key in co-ed basketball and girl's baskets are worth 3 points and guys only 1
- have an all guy's shift followed by an all girls shift
- if numbers justify it, have a competitive schedule and a recreational schedule.

## **11 COMMANDMENTS FOR AN ENTHUSIASTIC TEAM**

1. HELP EACH OTHER BE RIGHT – NOT WRONG.
2. LOOK FOR WAYS TO MAKE NEW IDEAS WORK – NOT FOR REASONS THEY WON'T
3. IF IN DOUBT – CHECK IT OUT! DON'T MAKE NEGATIVE ASSUMPTIONS ABOUT EACH OTHER.
4. HELP EACH OTHER WIN AND TAKE PRIDE IN EACH OTHER'S VICTORIES.
5. SPEAK POSITIVELY ABOUT EACH OTHER AND ABOUT YOUR ORGANIZATION AT EVERY OPPORTUNITY.
6. MAINTAIN A POSITIVE MENTAL ATTITUDE NO MATTER WHAT THE CIRCUMSTANCES.
7. ACT WITH INITIATIVE AND COURAGE AS IF ALL DEPENDS ON YOU.
8. DO EVERYTHING WITH ENTHUSIASM – IT'S CONTAGIOUS.
9. WHATEVER YOU WANT – GIVE IT AWAY.
10. DON'T LOSE FAITH – NEVER GIVE UP.
11. HAVE FUN!!

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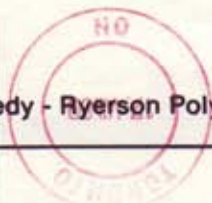
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