How much physical activity is needed to improve health

Highlights of a position statement of the Kino-Québec scientific committee... and a little more for health practitioners

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A little bit can do a lot, but more is even better

A message for health professionals

Everyone whose work involves the promotion of a physically active lifestyle—physical education teachers, kinesiologists, doctors, nurses, dieticians, physiotherapists, etc.—will find helpful information in the position statement of the Kino-Québec science committee on the amount of physical activity required in order to gain health benefits. The position statement reports the conclusions of many experiments and epidemiological studies on this question.

The position statement explains how regular physical activity can reduce the risk of contracting or of dying prematurely of certain health problems that affect a large proportion of the population: various cardiovascular diseases and the risk factors associated with them (dyslipidemia and hypertension), diabetes, obesity and colon cancer.

This question is very important from the perspective of the collective effort to promote physical activity, especially since two thirds of Quebeckers aged 15 or over are sedentary, slightly active or only sporadically active in their leisure time.

This brochure presents the highlights of the scientific committee's position statement and some ways in which it may be applied. It is divided into four parts, on the following subjects:

- A new view of the relationship between physical activity and health
- The relationship between physical activity and each of the diseases it may help prevent or cure
- The effect a decrease in sedentariness in the population may have on health care needs and costs
- A list of factors that should be considered when seeking to encourage various types of people to adopt a more active lifestyle, factors such as the choice of physical activity and the amount to aim for

Physical activity needed to improve health: A new way of looking at things

The main findings of the Kino-Québec scientific committee show a new relationship between the amount of physical activity and the health benefits. This relationship, which is illustrated in Figure 1, may be summarized as follows:

1. The more active a person is, the better his or her health will be.

2. There seems to be no level below which physical activity has no positive effect on health; any increase, however small, is beneficial.

3. By increasing physical activity (even slightly), a sedentary person can obtain major health benefits.

4. In absolute terms, a given increase in physical activity has a greater effect for a sedentary or slightly active person than for an active person.

It is thus not true to say, as we have tended to do until recently, that there is no benefit in physical activity unless a person reaches a relatively high level of physical activity.

> For a sedentary person, increasing the level of physical activity even slightly has substantial benefits.
>
> **Claude Bouchard**, Ph.D., chair, Kino-Québec scientific committee

In general, the minimum amount of physical activity that can have an appreciable preventive or curative effect is not as high as that required to improve physical performance and its determinants, such as maximal oxygen uptake.

Insérer à peu près ici la figure 1.

It is mainly through epidemiological data on mortality from heart disease that the link between physical activity and health began to become evident. Since then, a growing body of data has confirmed that the higher the degree of physical activity, the lower the risk of contracting several diseases or dying prematurely of them. The effect of a given amount of physical activity is more pronounced on a sedentary person than on an active person.

*N.B.: In this figure, **physical activity** refers not to the intensity of the activity but rather to the **amount of activity**, such as the number of hours per week.*

Figure 1 provides a simple illustration of the general principles involved. But, like any model, it may apply quite differently from case to case. Thus, the health effects may vary depending on the characteristics of the activity (such as its **intensity**, the **expenditure of energy** involved, and its **nature**, **duration** and **frequency**) and the health problem concerned.

Diseases that physical activity may help prevent or cure

It has been found that the activities that may prevent metabolic or cardiovascular problems, certain forms of cancer, and obesity are those involving a substantial expenditure of energy. However, even a small amount of physical activity seems to be sufficient to achieve some beneficial effects, such as to maintain normal tissue response to insulin.

Another thing is clear: the **benefits** of physical activity for health, like those for physical qualities and performance, **wear off quickly if the activity is decreased or terminated and disappear completely after only a few weeks**.

While a large amount of high-intensity physical training may lead to greater effects on some of the health problems discussed, it increases the risk of injury due to accident, wear or overuse.

Relationship between physical activity and specific health problems according to a survey of the research by the Kino-Québec scientific committee

Lipid level – Physical activity has a beneficial effect on the levels of lipids and lipoproteins in the blood. Regular physical activity is associated with higher plasma levels of high-density lipoproteins (HDL). The levels of these lipoproteins (which protect against heart disease) generally increase by 5 to 10 percent in people who become physically active. The effects are even more marked in people who also lose weight. When physical activity involves a major expenditure of energy, it also lowers the level of triglycerides in the blood. High blood lipid and lipoprotein levels are associated with heart disease. We are thus justified in concluding that a physically active lifestyle reduces the risk of premature heart disease. Furthermore, physical exercise increases fibrinolytic activity and decreases clumping of blood platelets, which reduces the

risk of blood clots. There are also a number of studies showing that a physically active lifestyle has a beneficial effect on coagulation markers, which means that the risk of an acute cardiovascular accident (such as a myocardial infarction, unstable angina or peripheral vascular blockage) is less in people who are active.

Blood lipid, triglyceride and lipoprotein levels as well as fibrinolytic activity are related to risks of problems in the circulatory system. In Québec in 1990, 27.1 percent of adults between the ages of 18 and 74 had a ratio of total cholesterol to HDL cholesterol higher than 5, which is associated with increased risk of cardiovascular disease.

Cardiovascular disease – Both men and women who are sedentary have a higher mortality rate from cardiovascular disease than people who are active. Their risk of heart disease is 1.8 times that of active people. Physical activity has a protective effect against premature death in sedentary people who become physically active: the mortality rate decreases by 20 to 40 percent, which is almost as large as the reduction associated with stopping smoking. The result is proportional, that is, the greater the degree of physical activity, the larger the decrease in the risk of premature death, all other known risk factors being equal, such as body mass index, blood pressure, smoking, cholesterol level and family history. People in the worst **physical condition** have a higher mortality rate from cardiovascular disease or any other cause than those in good physical condition. The effect of a sedentary lifestyle on heart disease, such as myocardial infarction, is comparable to that of hypercholesterolemia, hypertension or smoking.

Cardiovascular disease is the main cause of morbidity and mortality in Québec; it is responsible for more than 35 percent of deaths.

Hypertension – Regular physical activity delays the onset of hypertension and reduces blood pressure in persons who already have this condition (by about 10 mm Hg on the average). The average reduction in arterial pressure is in the order of 3 mm in subjects whose blood pressure is normal, and goes up to 6 mm Hg in those with slightly elevated blood pressure. Lack of physical activity or poor physical fitness increases the risk of hypertension by 30 to 50 percent. Mediocre physical condition increases the risk of mortality in men with hypertension. Regular physical activity of moderate intensity lowers blood pressure as much as, if not more than, physical activity of a higher intensity.

The protective effect of physical activity against hypertension is all the more important in that hypertension is a major risk factor in cardiovascular and cerebrovascular disease. It is estimated that some 23 percent of men and 18 percent of women between the ages of 18 and 74 have high blood pressure.

Diabetes – Regular physical activity lowers the risk of non–insulin dependent diabetes (also know as type 2 diabetes). In a study of 5900 men, it was shown that the risk of this type of diabetes decreased by 6 percent with every 500-kcal increase in weekly energy expenditure. To help prevent diabetes or reduce its effects, exercise does not necessarily have to be done at high intensity, but it must be done frequently, for example, every day or every second day.

It is estimated that in the population between 25 and 64 years old, 6.2 percent of men and 5.9 percent of women have diabetes (in the population between 65 and 74 years old, these figures are 13.2 and 12.0 percent respectively).

Obesity – Physical activity, especially if it uses the large muscles, is accompanied by the expenditure of energy and can thus help in maintaining a stable body weight. Therefore, active people are less likely to put on weight over the years. Among people who are overweight, the loss of body fat is proportional to the amount of physical activity and the number of calories burned. People who were formerly obese have less difficulty maintaining their weight if they are physically active.

Obesity is an important public health problem. It plays a role in the onset of diabetes and increases the risk of premature death and hypertension, cardiovascular disease, certain cancers and osteoarthritis. In 1992 in Québec, 53 percent of men and 32 percent of women between the ages of 20 and 64 were overweight (body mass index of 25 or more).

Cancer – Physical activity in work or recreational activities reduces the risk of colon cancer. Some research reaches similar conclusions with respect to breast cancer and prostate cancer, but experts feel that the current data do not show as marked a protective effect as in the case of colon cancer.

In Québec, as in the rest of North America, the most common cancers are colorectal and lung cancer, as well as prostate cancer in men and breast cancer in women. It is estimated that there are about 33,000 new cases of cancer a year (about 4,200 cases of colorectal cancer) and about 16,500 deaths a year attributable to cancer in Québec.

Other diseases – The preventive and curative effects of regular physical activity are not limited to cardiovascular disease, obesity, diabetes, and colon cancer. However, the most convincing data concern these serious health problems affecting a very large part of the population. We also know that physical activity that involves sufficiently intense contractions of the skeletal muscles is needed to develop bone mass, and that such activity prevents osteoporosis, except possibly in the case of post-menopausal women who are not taking estrogen. In addition, there is some indication that physical activity, even of moderate or low intensity, has benefits for mental health; in particular, it appears to decrease anxiety and depression.

Between 1987 and 1992, the proportion of Quebeckers aged 15 years and older who said they were in emotional distress went from 19 to 26 percent. Among women from 15 to 24 years old, the percentage almost doubled in that period, rising from 13 to 35 percent.

An active population is less costly to the health care system

A physically active society is a healthier society. Since active people have less

probability of contracting serious illnesses that are very widespread, and since relatively inactive people who undertake a program of physical activity reduce their risk of contracting these diseases and dying prematurely, we can readily conclude that any increase in physical activity in the population will translate into a reduction of the need for health care, and thus of the cost.

We can therefore expect a major reduction in health care costs as a result of a minor increase in physical activity by people who are currently sedentary or not very active. For this reason, promoting a physically active lifestyle is the responsibility not only of public health practitioners but also of anyone in a position to help create the conditions conducive to regular physical activity, such as policy makers and business and trade union leaders. The population as a whole will ultimately benefit from an increase in the level of participation in physical activity.

A given increase in physical activity in a group of people who are sedentary or not very active will have a much greater effect on public health than a similar increase in people who are already active. Thus, even though it is more difficult to motivate sedentary or not very active people to "get moving," we should make every attempt to help at least those who are receptive to move along the continuum of physical activity. According to a study published in 1996 by Gaston Godin, Ph.D., and Raymond Desharnais, Ph.D., members of the Kino-Québec scientific committee, more than 40 percent of Quebeckers aged 15 years or older firmly intend to become physically active if they are not already.

What you need to know and say

The findings of the Kino-Québec scientific committee suggest that there is a need to change the message health professionals are conveying to the population in general and to people to whom we are recommending a more active lifestyle. First and foremost, we should emphasize that even a small increase in physical activity has major health benefits: *A little bit can do a lot.* This is particularly important in view of the fact that efforts made up to now to encourage more people to train intensively have not brought the results expected.

Often people who are considering undertaking a fitness program ask **what is the minimum level of physical activity** needed to improve their physical fitness or maintain their health. There is no miracle formula—the graph in Figure 1 shows that it is always better to do more! On the other hand it is possible, given the findings of the studies reviewed by the Kino-Québec scientific committee, to propose objectives that take into account the situation of the individual.

The following factors may be considered by health practitioners who want to promote a physically active lifestyle.

Physical activity is for everyone

All of us can improve our health by increasing our level of physical activity, regardless of our age, sex or current level of activity or physical fitness.

Regular activity is important

What is most important for the prevention of cardiovascular disease, diabetes, obesity and colon cancer is to have a **high weekly expenditure of energy throughout the year**.

Physical activity must be practised on a regular basis, that is, every day, or practically every day, all year round—even in winter—in order to have health benefits. There is good reason to believe that occasional periods of physical activity have very little cumulative effect. Furthermore, many of the positive effects of exercise wear off quickly when the level of activity is reduced and may even disappear completely after a few weeks of inactivity.

Any kind of physical activity is beneficial

The types of physical activity that are most likely to have positive effects on health include both **everyday activities** (such as housework or walking around) and **work-related activities** as well as **sports activities**, **recreational activities**, and **structured exercise programs**.

Locomotion activities such as walking, swimming, bicycling and cross-country skiing involve a high expenditure of energy while being relatively accessible. In addition, their intensity can be adjusted as desired.

It isn't necessary to do all the day's activity at one time

If a period of exercise lasts at least 10 minutes, it will have a beneficial effect, and that effect will supplement the effect of other exercise. Thus, a person who does three periods of physical activity in a day, each lasting 10 minutes, will experience the same benefits as a person who does 30 minutes of activity at one time.

It is important to recommend that people take advantage of every opportunity for physical activity (for example, using the stairs instead of taking the elevator), if only because this consolidates the habits that make up a physically active lifestyle.

If a period of exercise lasts at least 10 minutes, it will have a beneficial effect, and that effect will supplement the effect of other exercise.

It's the expenditure of calories that counts

You can gain the same health benefits (although perhaps not the same level of performance) by

doing a **low-intensity activity for a long time** (for example, walking at a normal pace) as by doing a moderate- or high-intensity activity for a short time (for example, walking fast or jogging).

Adapt the message to the person

It is important to take into account **people's individual situations** when encouraging them to make room for physical activity in their lives, and to try to determine:

Their behaviour

- Has the person been active or inactive over the last three months?
- Is the person active several days a week? Throughout the year? In all seasons, even winter?

Their attitude

- What is the person's attitude to the idea of increasing his or her level of physical activity?
- Can the person reasonably be expected to significantly increase his or her physical activity?

Their opportunities for physical activity

- What activities are most readily accessible to the person on weekends and during the week?
- Which of these activities could the person practise regularly in winter and throughout the year?

Their motivation

- What factors are most likely to motivate the person to increase his or her physical activity and maintain it at a high level?
- It is important to remember that the best motivation is **emotional** rather than cognitive.

About emotional motivation

- The type of physical activity should be chosen on the basis of **the person's tastes** and the **pleasure** they expect from the activity, rather than the virtues of the activity itself (while jogging is generally recognised as an effective mean of improving fitness, it does not appeal to everyone).
- The person should be encouraged to define his or her motivation with respect to each activity considered (pleasure, physical and mental well-being, increased fitness, help in weight control, better appearance, opportunities to meet or spend time with others, sharing a challenge with family members or friends, etc.).
- It is easier to maintain the motivation to be active when you have **family support** and the **activities are shared**.

About cognitive motivation

- **Fear of illness is not a very effective motivation** for people in good health,

especially if they are young.
- For many people, the idea of reducing the risk or the probability of contracting a disease is obscure and not readily understood.
- People who undertake an exercise program in order to improve their health generally have a hard time maintaining their motivation for more than a few weeks unless they find other motivations.
- Existing and potential obstacles should be identified and dealt with.

About motivation in general

- The reason people generally give for not doing enough physical activity is lack of time; people therefore need to organize their **schedule** appropriately to make time for their activity program.
- To encourage perseverance, it may be useful for the person to **keep a notebook on the activities done**; to **set objectives** on a weekly, seasonal and annual basis; and even to reward him or herself for meeting these objectives.

Targets to aim for: 500, 1000 and 1500 kcal per week

Many people have a perfectly legitimate need for **milestones** and **new targets** to aim for. Figure 2 may be used to meet this need and to provide a clearer indication of what it means concretely for a person to increase recreational physical activity to the point where it has health benefits. It shows examples of low-, moderate-, high- and very high-intensity physical activities and the amount of time needed to spend doing them weekly in order to attain a total energy expenditure of 500, 1000 or 1500 kcal.

Insérer à peu près ici la figure 2.

Targets recommended by Kino-Québec

- For a sedentary or not very active person, an increase of about **1000 kcal** in weekly energy expenditure (over the energy expenditure without recreational physical activity) is a good target.
- For a person who is resistant to such a major change, a target of **500 kcal** per week should be suggested—**a little bit can do a lot!**

A little bit can do a lot—but more is even better!

- For a person who is already active, an increase of **1500 kcal** or more in weekly energy expenditure is a good target.

Putting things into perspective

To illustrate your recommendations:

- Propose a range of physical activities of low, moderate or high intensity that are suitable for the person and at least some of which can be practised in winter.

- Indicate how long the activities at each level of intensity should be practised to reach a reasonable target that takes into account the person's situation and motivation. Obviously, there are a variety of possible combinations of activities from the different levels of intensity.

- In the case of locomotion activities, specify the distance that should be covered weekly to reach a particular target, for example, to increase weekly energy expenditure by about 1000 kcal: 5 km of swimming, 20 km of walking, 15 km of running, 35 km of cycling or 12 km of cross-country skiing.

Generally speaking, weekly energy expenditure can be increased by about 1000 kcal by practising a moderate-intensity activity 30 minutes a day, 6 or 7 days a week, or a low-intensity activity one hour a day, 5 or 6 days a week.

Walking or jogging: it's easy to estimate the energy expenditure

It is easy to calculate the energy expenditure involved in walking or jogging—popular, accessible activities—when you know that it takes an energy expenditure of about 1 kcal per kilogram of body weight for every kilometre of distance covered. This formula applies to walking as well as running. Thus, a woman weighing 60 kg who covers 5 km has an energy expenditure of approximately 300 kcal whether she runs (which will take about 30 min) or walks (which will take about 55 min).

Conclusion

Kino-Québec, whose mission is to promote a physically active lifestyle to Quebeckers, encourages health professionals to change their view of the relationship between physical activity and health. We can expect a major improvement in the health and well-being of the population and, therefore, in the medium and long term, a substantial reduction in the demand for health care, if we succeed in motivating more people, especially those who are sedentary or not very active, to adopt and maintain a physically active lifestyle.

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To order a copy of the position statement of the Kino-Québec scientific committee, entitled *Quantité d'activité physique requise pour en retirer des bénéfices pour la santé*, call Kino-Québec at (418) 646-6555 or visit its Web site:

www.kino-quebec.qc.ca

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Figure 1
Physical Activity and Health

Health benefits
Amount of physical activity
low
moderate
high
very high

Figure 2
How to Expend 500, 1000 or 1500 kcal/week

Amount of time required (hours)

Low-intensity activities
Estimated energy expenditure: up to 4 kcal/min

Billiards
Dusting
Social dancing
Bowling
Volleyball, team, non-competitive
Miniature golf
Walking at a normal pace
Washing the windows or the car
Frisbee

Moderate-intensity activities
Estimated energy expenditure: 4 to 8 kcal/min

Walking quickly
Bicycling at 15 km/h
Raking leaves
Cross-country skiing, flat area
Downhill skiing
Aerobic dancing, low-impact
Golf, carrying clubs
Dance, choreographed, folk, disco
Shovelling snow
Swimming, moderate effort

Tennis, doubles

High-intensity activities
Estimated energy expenditure: 8 to 12 kcal/min

Hiking, carrying a backpack
Aerobic dancing, with impact
Badminton, vigorous
Bicycling, 20 km/h
Swimming, vigorous
Fitness, in a class or using equipment
Cross-country skiing, vigorous
Jogging, 8 km/h
Tennis, singles
Ice hockey
Mountain biking

Very high-intensity activities
Estimated energy expenditure: more than 12 kcal/min

Running, more than 10 km/h
Cross-country skiing, hilly terrain
Soccer, competitive
Racquetball or squash, competitive
Martial arts
Skipping rope
Mountain biking, rugged terrain