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Oxidative stress

Fruits and Vegetables to Counter Aging

By Abdel Khalil, Ph.D.

Eating foods which are rich in antioxidants - including fruits and vegetables - increases our ability to limit the effects of aging and age-related diseases.

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Abdel Khalil, Ph.D.
Coordinator of the Biological Mechanisms of Aging Axis at the Research Centre on Aging (CDRV); associate professor at the department of medicine, division of geriatrics of the faculty of medicine and health sciences of the Université de Sherbrooke.

There is a saying in French that we are as old as our arteries. Popular wisdom, on the other hand, fails to mention that we are able to maintain our arteries in very good condition. How? By eating many fruits and vegetables every day, according to the work of Professor Abdelouaed Khalil, coordinator of the *Biological Mechanisms of Aging* axis at the Research Centre on Aging (CSSS-IUGS).

Over the course of research led for the NuAge study on nutrition, Dr. Khalil's team showed that the more we eat fruits and vegetables rich in vitamins A, C and E (5 daily servings or more), the more the blood is rich in antioxidants. On the hand, those who eat few fruits and vegetables have fewer antioxidants in their blood.

The role of antioxidants is essential in stopping damage caused by aging and reducing the risk of suffering from a cardiovascular disease such as an infarction (heart attack) or a cerebrovascular accident (CVA).

A few basic notions need to be reviewed to better understand what oxidants are and the role that they play in healthy aging.

Avoiding oxidative stress!

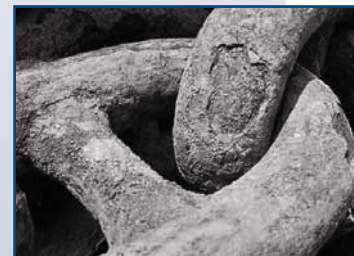
The human body faces a paradox. To live, it needs oxygen; however, this gas can also become toxic if the natural defence mechanisms of the body are weakened. Approximately 5% of the oxygen that we breathe is transformed into molecules which are toxic for the cells of our bodies. These molecules are called *free radicals* - unstable molecules which attack neighbouring cells and cause damage. Many theories abound to explain aging, but the most generally accepted one attributes the role of free radicals to this process.

The action of free radicals on the body may be compared to that of oxygen and rust. The system *rusts* and all sorts of alterations are caused by the oxidation. Atherosclerosis illustrates this point: as a result of the oxidation of cholesterol in the blood, fatty substances are deposited on the walls of the arteries, causing them to lose resistance and increasing the risk of blockage.

Under normal circumstances, there is an equilibrium between the number of free radicals and antioxidants. An overproduction of free radicals or a reduction in the number of antioxidants in the blood causes an imbalance in the body

See FRUITS AND VEGETABLES on page 4...

WERE YOU AWARE THAT ... ?
Cardiovascular diseases are the primary cause of death in Canada (37% for all ages, 80% for seniors aged 65 and older)



This newsletter is intended for people who participated in the Research Centre on Aging's projects

It is also distributed to anyone who wants to receive it. Please contact us for more information (see page 4).

An Age-friendly Quebec

By Marie Beaulieu, Ph.D. et Suzanne Garon, Ph.D.



Marie Beaulieu is a researcher at the Research Centre on Aging (CDRV) and a full professor at the department of social services of the faculty of letters and humanities of the Université de Sherbrooke.



Suzanne Garon is an associate researcher at the Research Centre on Aging (CDRV) and a full professor at the department of social services of the faculty of letters and humanities of the Université de Sherbrooke.

In the spring of 2008, the Government of Québec announced that it would support the implementation of the Age-friendly Cities program in seven cities across the province with a \$2.8-million budget over a five-year period.

Researchers Marie Beaulieu and Suzanne Garon of the Research Centre on Aging of the CSSS-IUGS have been mandated to supervise the different stages of the Age-friendly Cities Program. They will conduct a series of studies to evaluate the implementation and the concrete effects of the Age-friendly Cities program (Ville-amie des aînés) on senior populations.

This project arose from a single premise: across the globe, the proportion of seniors is increasing more rapidly in urban centres than in rural environments. Researchers from 33 cities and 22 countries responded to the World Health Organization (WHO) initiative to better understand the role of seniors in cities and their particular problems, and to propose solutions.

In Sherbrooke, Ms. Beaulieu and Ms. Garon have led the study for the WHO. Their data have been compared with those of other very diversified cities such as Tokyo, Melbourne, Shanghai, Portland, Geneva, and so on.

The findings? Seniors across the planet share similar preoccupations such as the importance of feeling *at home*, the desire to have inter-generational relationships rather than living in *ghettos* for seniors, transportation, access to community care and medications, and so on. Across the globe, seniors express a strong desire to continue to participate in social and cultural development.

Following this international study, the WHO published *Global Age-friendly Cities: A Guide* in October 2007. This guide contains 40 proposals to help cities develop programs to improve conditions for seniors aged 60 and older.

“Making cities age-friendly is one of the most effective policy approaches for responding to demographic ageing,” according to the WHO.

In Quebec, the publication of this guide coincided with the public consultation on the living condition of seniors led by Minister Marguerite Blais. The Ministère de la Famille et des Aînés decided to support the implementation of the Age-friendly Cities initiative in seven cities and MRCs until 2013. They are: Drummondville, Quebec City, Rimouski, Rivière-du-loup, MRC de Témiscamingue, Granby and Sherbrooke.



The researchers are mandated to support each of the seven cities and MRCs in assisting their project managers and steering committees appropriate the different stages of the program as a whole. A needs and expectations assessment for seniors will be completed in each city. In addition, an inventory of the specific elements and existing services offered by each city is under way. Action plans will then need to be implemented. They will contain various mechanisms to assess the implementation and measures taken as part of the *Age-friendly Cities* initiative.

From the perspective of the WHO, focused as it is on community development, health is not just an individual concern: it is a global preoccupation. The approach is participatory: local communities become directly involved in the changes implemented to improve the living conditions of their seniors.

The project requires not only the direct involvement of seniors, but also of seniors' groups, social services, municipalities, and so on. Each city will have its own diagnosis and action plan for its own priorities (i.e. increasing public transportation to improve the mobility of seniors, encouraging access to fitness and recreation centres, changing methods to contact cities, and so on).

At the crossroad of research in health and social services, *Age-friendly Cities* will also serve as a vehicle for many studies. At the end of the project, the Ministère de la Famille et des Aînés will have three guides adapted from *Age-friendly Cities* to the different urban, semi-urban and rural realities of Quebec. These guides will be made available to the cities of Quebec that wish to become *age-friendly*.

WERE YOU AWARE THAT... ?
The City of Sherbrooke is the only francophone city in North America to have participated in the WHO study to develop the Age-friendly Cities guide.



Ms. Marguerite Blais, the minister responsible for seniors, and two researchers during the launch of the Age-friendly Cities project in Sherbrooke.

Maladies dégénératives du cerveau : Un guide pour soutenir des proches-aidants

Par Dr Marcel Arcand



Dr Marcel Arcand est chercheur au Centre de recherche sur le vieillissement et médecin en soins de longue durée au CSSS-IUGS. Il est également professeur titulaire au département de médecine de famille de la Faculté de médecine et des sciences de la santé à l'Université de Sherbrooke.

Accompagner un malade au long d'une maladie dégénérative du cerveau suscite de nombreuses questions pour les proches. Les conseils que leur prodigue un petit guide mis au point au Centre de recherche suscitent l'intérêt dans de nombreux pays.

Publié originellement en français et en anglais à Sherbrooke, le livret *Les soins de confort en fin de vie dans la maladie d'Alzheimer et les autres maladies dégénératives du cerveau : un guide pour les proches* connaît maintenant une carrière internationale surprenante. Ainsi, une traduction et adaptation du livret est déjà diffusée à travers l'Italie par l'Association italienne pour la maladie d'Alzheimer et semble fort populaire. Des chercheurs d'Amsterdam aux Pays-Bas vont lancer d'ici quelques jours la version néerlandaise. Des collègues de plusieurs autres pays (Japon, Brésil, Espagne, France, Belgique, Israël et États-Unis) ont aussi manifesté leur intérêt pour traduire et adapter le livret à leur contexte légal et culturel.

L'histoire du livret commence en 2002 alors que Chantal Caron et Dr Marcel Arcand, tous les deux chercheurs au Centre de recherche, obtiennent une subvention de la Société Alzheimer du Canada pour étudier le point de vue des familles qui participent aux décisions médicales, lorsqu'un de leur proche est atteint de démence avancée en fin de vie. Les résultats de cette recherche permettent de mieux comprendre ce que vivent ces familles. Et les chercheurs conçoivent alors un petit livret pour outiller les familles en quête d'informations ou de conseils. Le livret est finalement publié en 2005 et diffusé via le Centre d'expertise en santé de Sherbrooke.

Ce livret tente de répondre de manière simple et claire aux interrogations les plus fréquentes des proches: comment s'établit le pronostic de ces maladies dans les stades avancés, et quelle est généralement leur évolution? Quelles sont les difficultés cliniques les plus fréquentes (hydratation et nutrition artificielle, antibiothérapie pour des infections à répétition, les questions de transfert à l'hôpital etc.)? Quel devient aussi le rôle des représentants du malade lorsque ce dernier ne peut plus participer activement aux décisions? Comment contrôler la

WERE YOU AWARE THAT...?
Une copie du livret peut être obtenue gratuitement à partir du site web suivant :
www.expertise-sante.com/guides-pratiques.htm

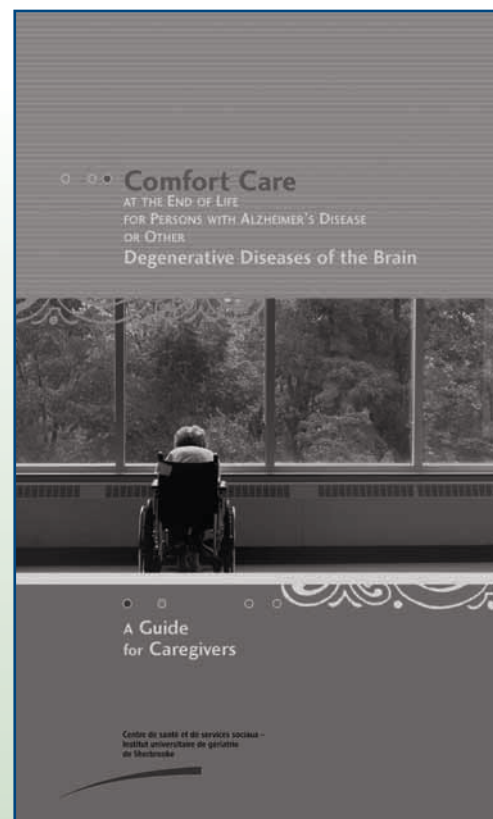
douleur et les difficultés respiratoires? Comment traverser les derniers moments et le deuil ?

L'information présentée dans ce Guide peut aider les familles à mieux comprendre les avantages et les inconvénients des différents choix qui se présentent à elles. Cela les aide à participer de manière plus éclairée aux décisions.

Le Guide peut également déculpabiliser les familles lorsqu'elles se trouvent devant un choix difficile, qui crée souvent de l'anxiété ou de la culpabilité : faut-il cesser une thérapie ou s'abstenir d'en donner une, pour prolonger la vie ? On parle alors de ne plus prodiguer que des soins de confort. Tout en rappelant que l'on doit avant tout respecter les valeurs et croyances de chacun, le livret souligne que notre premier devoir à ce stade de la maladie est de soulager et d'éviter la prolongation des souffrances de ces malades.

Habituellement, les médecins et infirmières remettent le livret aux familles au moment des discussions sur les objectifs de soins, lorsque la situation du malade se dégrade ou lorsque ce dernier est en phase terminale. Beaucoup de familles veulent alors discuter les enjeux de manière plus approfondie et personnalisée. Avec l'aide de ce Guide, les professionnels se familiarisent eux aussi avec les questions des familles, qui demandent qu'on leur consacre davantage de temps pour mieux aborder cette étape que traverse leur proche.

Les travaux de recherche poursuivis en 2005-2006 suggèrent que le livret peut aussi servir de matériel éducatif pour aider les professionnels à mieux communiquer avec les proches. D'autres travaux de recherche en cours permettront de bonifier le livret et de développer des programmes de formation des professionnels dans ce domaine. 📖



...FRUITS AND VEGETABLES

(continuation of page 1)



which is known as *oxidative stress*. This is associated with many diseases, such as diabetes, cardiovascular diseases, cataracts, Parkinson's disease and Alzheimer's disease, which are common at an advanced age .

Fortunately, the body has a type of antidote to counter the effects of free radicals by neutralizing their action – *antioxidants*. Antioxidants are made up of enzymes produced by our body and of elements contained in the foods that we eat, in particular certain vitamins (A, C, E) which are present in large amounts in fruits and vegetables (see table).

By comparing the eating habits of 100 participants in the NuAge study with their blood analyses, Dr. Abdel Khalil demonstrated that there is a direct link between the level of antioxidants in the blood and the quantity of vitamin-rich foods rich that we consume on a daily basis. The more fruits and vegetables we eat, the more effective our body is in neutralizing free radicals. This dietary contribution becomes even more significant with aging as the amount of free radicals increases. We must therefore fight the effects of free


For 100 g of
fruits and vegetables...

Every day, our body required
3,000 to 5,000 units of
oxygen radical absorbing
capacity (ORAC).

	ORAC
Prune	5,770
Dried raisin	2,830
Blueberry	2,400
Blackberry	2,036
Garlic	1,939
Kale	1,770
Strawberry	1,540
Raspberry	1,260
Spinach	1,220
Orange	750
Black grape	739
Red pepper	710
Cherry	670
Kiwi	602
Pink grapefruit	483

radicals by adopting or maintaining healthy eating habits.

Dr. Abdel Khalil will be pursuing his studies on the effects of antioxidants in certain foods. He has

initiated new research on the daily consumption of olive oil, which is rich in vitamin E. Olive oil is a basic element of the *Mediterranean diet*, which is often quoted as an example for its health benefits. This study is funded by the Canadian Institutes of Health Research (CIHR). 



**Centre de recherche
sur le vieillissement**
Research Centre
on Aging

1036, rue Belvédère Sud
Sherbrooke, Québec J1H 4C4

Tel. : 819 821-1170, poste 45131

Contact : lucie.duquette@usherbrooke.ca

Web site : <http://www.cdrv.ca>

Committee :
Martin Brochu, Marie-France Dubois,
Laurent Fontaine, Nancy Leclerc

Graphic design : Graphic-Art
Printing : Imprimerie Martineau

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