Cette présentation a été effectuée le 25 novembre 2014 au cours de la journée « La promotion de saines habitudes de vie et la prévention de l'obésité : doit-on ajuster le tir? » dans le cadre des 18es Journées annuelles de santé publique (JASP 2014). L'ensemble des présentations est disponible sur le site Web des JASP à la section Archives au : http//jasp.inspq.qc.ca.

La prévention de l'obésité comme cible d'intervention:

Bien comprendre le paradoxe de l'indice de masse corporelle (IMC)

Jean-Pierre Després, Ph. D., FAHA, FIAS
Directeur de la recherche, cardiologie, CRIUCPQ
Directeur scientifique, ICCR
Département de kinésiologie, Faculté de médecine
Université Laval, Québec, Canada

INSTITUT UNIVERSITAIRE DE CARDIOLOGIE ET DE PNEUMOLOGIE DE QUÉBEC

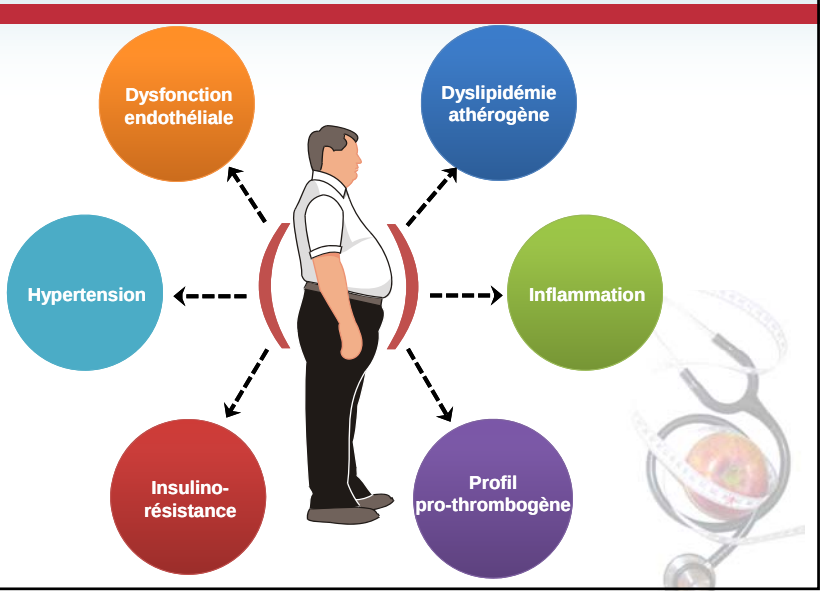
UNIVERSITÉ LAVAL

Chaire internationale sur le risque cardiométabolique

CENTRE DE RECHERCHE
INSTITUT UNIVERSITAIRE DE CARDIOLOGIE ET DE PNEUMOLOGIE DE QUÉBEC

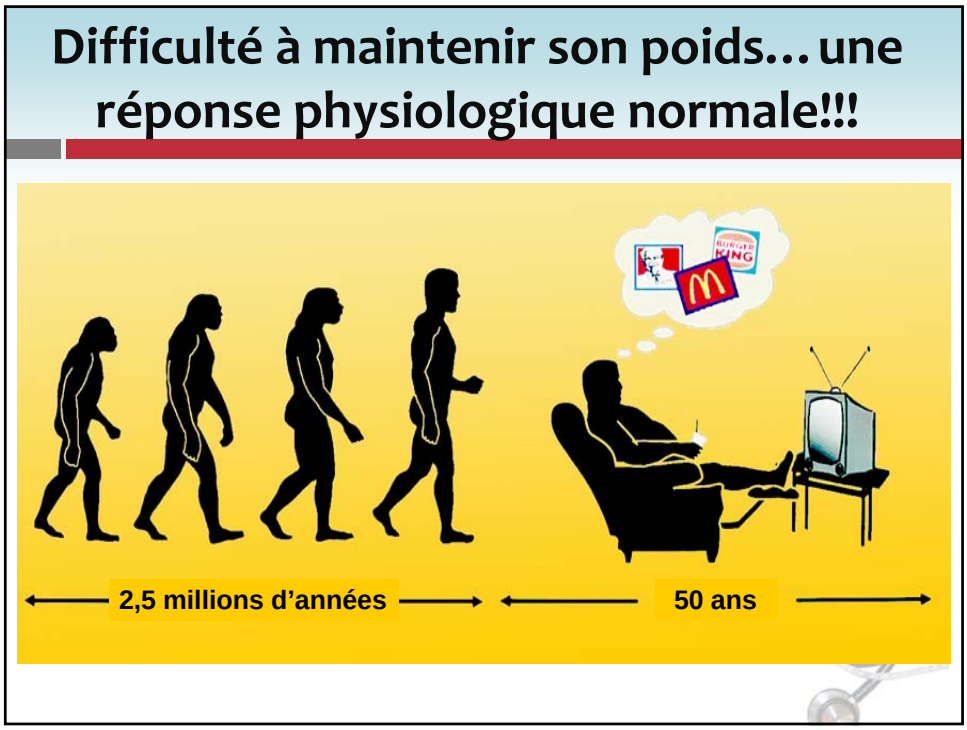
UNIVERSITÉ LAVAL

Notre objectif : prévenir et prendre en charge l'obésité abdominale par la qualité nutritionnelle et l'activité physique

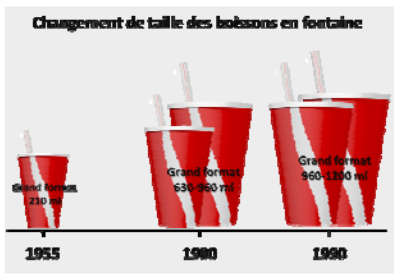


www.myhealthywaist.org visité par 168 pays

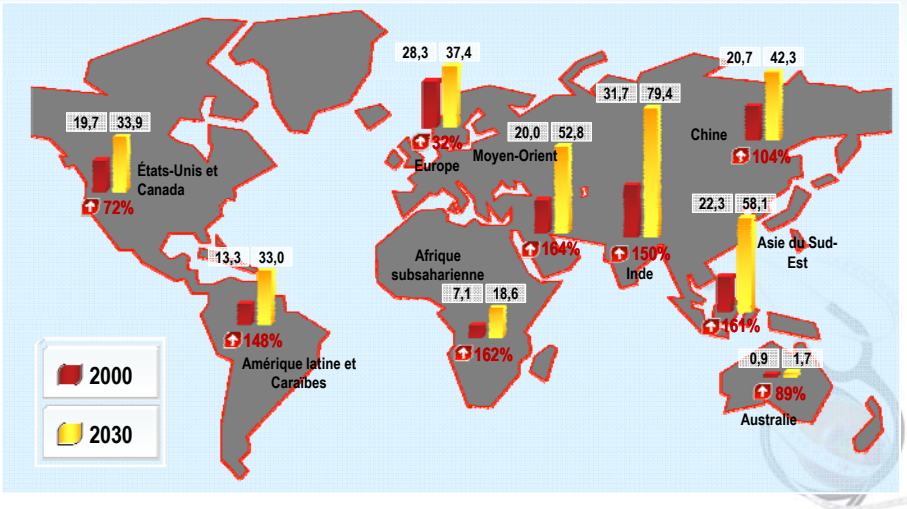

5th
ICCR CONFERENCE ON
CHRONIC SOCIETAL
CARDIOMETABOLIC DISEASES
8 to 12
July 2015
Québec City
QC, Canada
Organized by
International Chair on
Cardiometabolic Risk
CMDO
CENTRE DE RECHERCHE
INSTITUT UNIVERSITAIRE
DE CARDIOLOGIE
ET DE PNEUMOLOGIE
DE QUÉBEC
UNIVERSITÉ
LAVAL


Difficulté à maintenir son poids… une réponse physiologique normale!!!
2,5 millions d'années
50 ans

Notre mode de vie toxique…



Prévalence mondiale du diabète en 2000 et estimations pour 2030 (en millions)



Source : Chaire internationale sur le risque cardiométabolique
www.myhealthywaist.org

Adapté de Hossain P et al. N Engl J Med 2007;356:213-5

International Conference on Nutrigenomics and Metabolic Health 2012

October 15-16, 2012

Lecture Hall, Shanghai Institutes for Biological Sciences Building, CAS
320 Yueyang Road, Shanghai, China

Organized by

Key Laboratory of Nutrition and Metabolism, INS, SIBS,CAS,China
Institute for Nutritional Sciences, SIBS, CAS, China
Harvard School of Public Health,USA
Shanghai JiaoTong University School of Public Health, China
Laval University, Quebec, Canada

HARVARD SCHOOL OF PUBLIC HEALTH

UNIVERSITÉ LAVAL

Chine : 114 millions de diabétiques…

International Conference on Nutrigenomics and Metabolic Health, Shanghai, 15-16 octobre, 2012

Quelques statistiques pour le Québec…

- 760 000 ont le diabète…
  …une maladie sociétale!
- Faire le pont entre la clinique et la santé publique…

Source : Diabète Québec 2009

Nos progrès en médecine cardiovasculaire
Attention de ne pas crier victoire trop vite!!!

Tabagisme
Hypercholestérolémie
Hypertension

1950-60

Diabète de type 2
Malnutrition/sédentarité
Obésité abdominale

1990-00…

- **Statines**
- **Médicaments hypertension**
- **Contrôle tabagisme**

- **Sédentarité**
- **↑ densité énergétique des aliments**

La médecine a ajouté des années à la vie (notre espérance de vie est bonne) mais…

- Procédures tardives et médicaments.
- Des changements fondamentaux dans les comportements santé à l'échelle de la population causent préjudice à nos efforts, augmentent les coûts de santé et diminuent la productivité.
- La médecine garde les patients vivants mais… très malades.

Mozaffarian D J Am Coll Cardiol 2011;57:1697-9

Des maladies cardiovasculaires à la santé cardiovasculaire : Une « révolution tranquille »

AHA Special Report

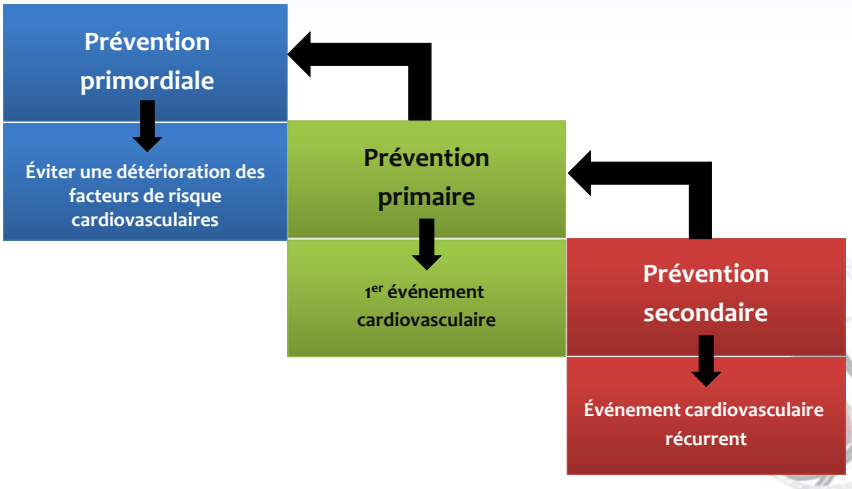
Defining and Setting National Goals for Cardiovascular Health Promotion and Disease Reduction

The American Heart Association's Strategic Impact Goal Through 2020 and Beyond

Donald M. Lloyd-Jones, MD, ScM, FAHA, Chair;
Yuling Hong, MD, MSc, PhD, FAHA*; Darwin Labarthe, MD, MPH, PhD, FAHA*;
Dariush Mozaffarian, MD, DrPH, FAHA; Lawrence J. Appel, MD, MPH, FAHA;
Linda Van Horn, PhD, RD, FAHA; Kurt Greenlund, PhD*; Stephen Daniels, MD, PhD, FAHA;
Graham Nichol, MD, MPH, FAHA; Gordon F. Tomaselli, MD, PhD, FAHA; Donna K. Arnett, PhD, FAHA;
Gregg C. Fonarow, MD, FAHA; P. Michael Ho, MD, PhD; Michael S. Lauer, MD, FAHA;
Frederick A. Masoudi, MD, MPH; Rose Marie Robertson, MD, FAHA; Véronique Roger, MD, FAHA;
Lee H. Schwamm, MD, FAHA; Paul Sorlie, PhD; Clyde W. Yancy, MD, FAHA;
Wayne D. Rosamond, PhD, FAHA; on behalf of the American Heart Association Strategic Planning Task Force and Statistics Committee

Lloyd-Jones DM et al. Circulation 2010;121:586-613

Modèle proposé afin de développer le concept de santé cardiovasculaire idéale



Adapté de Lloyd-Jones DM et al. Circulation 2010;121:586-613 et JP Després Les actualités du coeur 2012;15:2-3

Mesures qui définissent la santé cardiovasculaire idéale

- 3 facteurs biologiques favorables :
  - Cholestérol < 5,2 mmol/l
  - Tension artérielle (non traitée) < 120/< 80 mm Hg
  - Absence de diabète : glucose < 5,6 mmol/l
- 4 comportements idéaux :
  - Non fumeur
  - IMC < 25 kg/m²
  - Niveau d'activité physique à la cible (150 min modérée/semaine)
  - Indice de qualité nutritionnelle
- Absence d'événements cardiovasculaires

Lloyd-Jones DM et al. Circulation 2010;121:586-613

Pourcentage de la population avec une santé cardiovasculaire idéale?

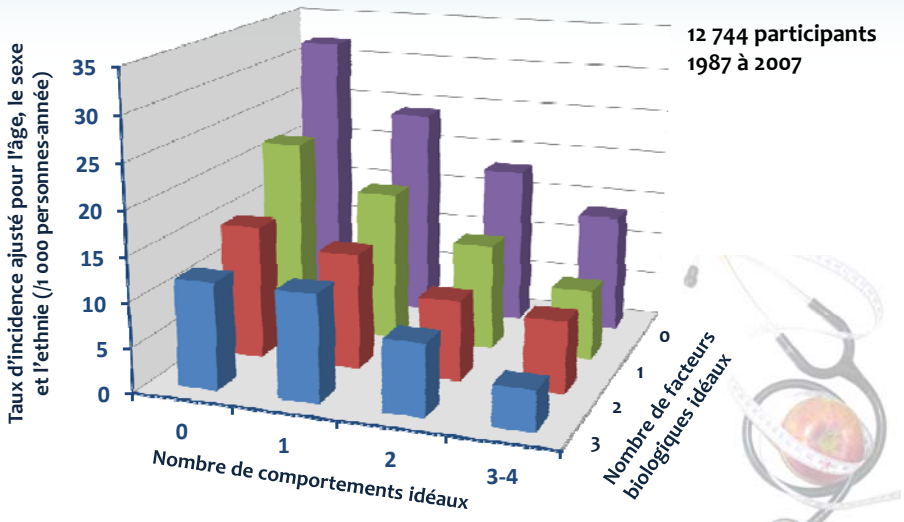
Avec les 7 critères simples?

0,1 %!!!

Étude ARIC
n=12,744
Folsom AR et al. J Am Coll Cardiol 2011;57:1690-96

Cohorte Kailuan, Nord de la Chine
n=101,510
Wu S, Huang Z, Yang X, et al. Circ Cardiovasc Qual Outcomes 2012;5:487-93

Incidence de maladies cardiovasculaires en fonction des facteurs de risque biologiques et comportementaux

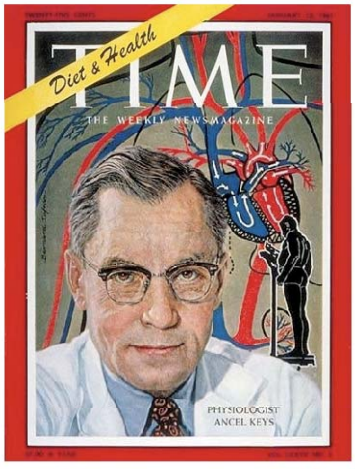


Folsom AR et al. J Am Coll Cardiol 2011;57:1690-96

Afin de prévenir de façon optimale les maladies cardiovasculaires, il est aussi important de cibler les facteurs de risque comportementaux que les facteurs de risque biologiques (tension artérielle, cholestérol, diabète).

L'obésité

De quoi parlons-nous?



Ancel Keys

J Chron Dis 1972. Vol. 25, pp. 329–343. Pergamon Press. Printed in Great Britain

INDICES OF RELATIVE WEIGHT AND OBESITY

ANCEL KEYS,* FLAMINIO FIDANZA,† MARTTI J. KARVONEN,‡ NOBORU KIMURA,§ and HENRY L. TAYLOR¶

(Received 17 September 1971; in final form 27 December 1971)

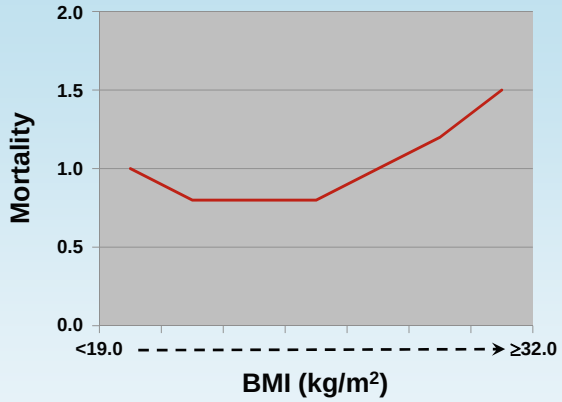
INTRODUCTION

THE NEED for an index of relative body weight was recognized from the beginning of anthropometry, that is to say as soon as serious attention was given to the dimensions of the body and their biological and medical implications. Body weight in proportion to height or to some function of height is interesting because it should indicate something about 'build' or shape and about obesity or fatness.

Various indices of relative weight have been espoused and applied for many years but as yet there is no agreement on any particular index. In part this reflects confusion —or at least lack of agreement—about what a relative weight index should represent and mean; in part the reason is a lack of "calibrating" data and of systematic examination of wide-ranging samples of data analyzed in parallel. The purpose of this paper is to provide a comparison of various indices of relative weight as applied to data on weight, height and body fatness of men in several countries in Europe, in Japan, men in South Africa, as well as of white men in the United States.

In the present paper guidance in the analysis was provided by two assumptions. First, it is assumed that a major reason for the use of a relative weight index is to remove the dependency of weight on height. Second, it is assumed that in the selection of an index attention should be given to the degree to which the index may indicate relative obesity or body fatness.

Risque relatif de mortalité associé à l'IMC (BMI)



Adapted from Manson JE et al. N Engl J Med 1995; 333: 677–85

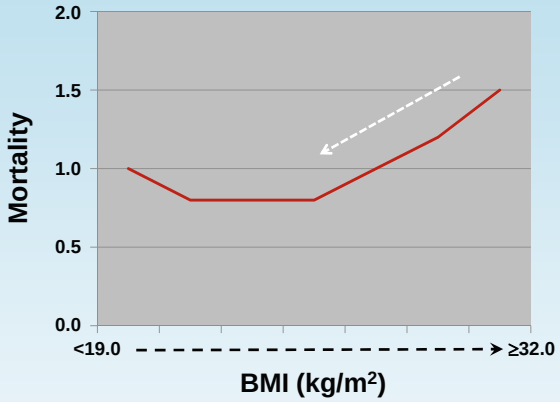
La définition traditionnelle de l'obésité

$$\text{IMC} = \frac{\text{Poids (kg)}}{\text{Taille}^2\ (\text{m}^2)}$$

	IMC (kg/m²)	Risque de comorbidités
Poids santé	18,5-24,9	Normal
Surpoids	25,0-29,9	Augmenté
Obésité classe I	30,0-34,9	Élevé
Obésité classe II	35,0-39,9	Très élevé
Obésité classe III	≥ 40,0	Extrêmement élevé

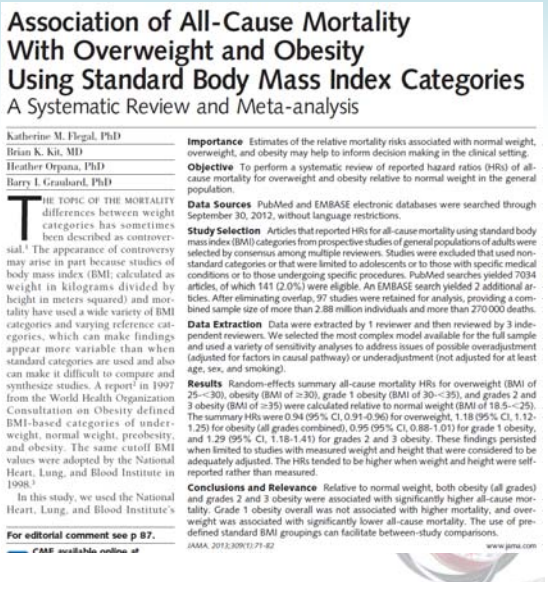
Adapté de l'Organisation mondiale de la santé (1998)

Réduire le poids pour réduire le risque?



Adapted from Manson JE et al. N Engl J Med 1995; 333: 677–85

- 2.88 million individuals
- 270,000 deaths



Association of All-Cause Mortality With Overweight and Obesity Using Standard Body Mass Index Categories

A Systematic Review and Meta-analysis

Katherine M. Flegal, PhD
Brian K. Kit, MD
Heather Orpana, PhD
Barry I. Graubard, PhD

THE TOPIC OF THE MORTALITY differences between weight categories has sometimes been described as controversial.[1] The appearance of controversy may arise in part because studies of body mass index (BMI; calculated as weight in kilograms divided by height in meters squared) and mortality have used a wide variety of BMI categories and varying reference categories, which can make findings appear more variable than when standard categories are used and also can make it difficult to compare and synthesize studies. A report[2] in 1997 from the World Health Organization Consultation on Obesity defined BMI-based categories of underweight, normal weight, preobesity, and obesity. The same cutoff BMI values were adopted by the National Heart, Lung, and Blood Institute in 1998.[3]

In this study, we used the National Heart, Lung, and Blood Institute's

For editorial comment see p 87.

Importance Estimates of the relative mortality risks associated with normal weight, overweight, and obesity may help to inform decision making in the clinical setting.

Objective To perform a systematic review of reported hazard ratios (HRs) of all-cause mortality for overweight and obesity relative to normal weight in the general population.

Data Sources PubMed and EMBASE electronic databases were searched through September 30, 2012, without language restrictions.

Study Selection Articles that reported HRs for all-cause mortality using standard body mass index (BMI) categories from prospective studies of general populations of adults were selected by consensus among multiple reviewers. Studies were excluded that used nonstandard categories or that were limited to adolescents or to those with specific medical conditions or to those undergoing specific procedures. PubMed searches yielded 7034 articles, of which 141 (2.0%) were eligible. An EMBASE search yielded 2 additional articles. After eliminating overlap, 97 studies were retained for analysis, providing a combined sample size of more than 2.88 million individuals and more than 270 000 deaths.

Data Extraction Data were extracted by 1 reviewer and then reviewed by 3 independent reviewers. We selected the most complex model available for the full sample and used a variety of sensitivity analyses to address issues of possible overadjustment (adjusted for factors in causal pathway) or underadjustment (not adjusted for at least age, sex, and smoking).

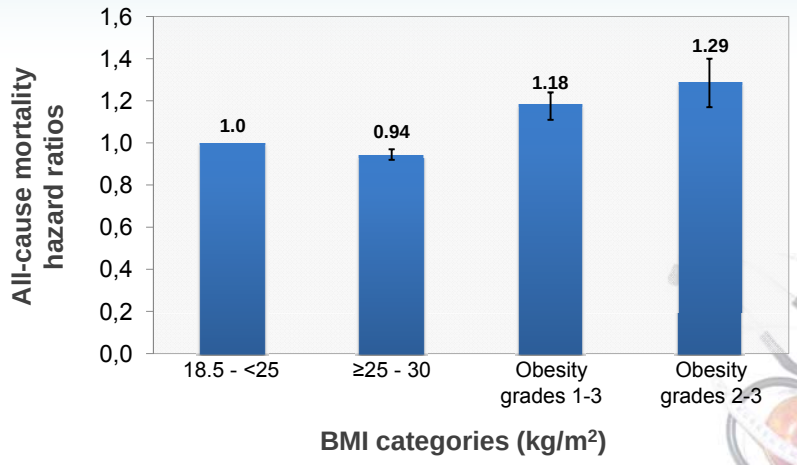
Results Random-effects summary all-cause mortality HRs for overweight (BMI of 25-<30), obesity (BMI of ≥30), grade 1 obesity (BMI of 30-<35), and grades 2 and 3 obesity (BMI of ≥35) were calculated relative to normal weight (BMI of 18.5-<25). The summary HRs were 0.94 (95% CI, 0.91-0.96) for overweight, 1.18 (95% CI, 1.12-1.25) for obesity (all grades combined), 0.95 (95% CI, 0.88-1.01) for grade 1 obesity, and 1.29 (95% CI, 1.18-1.41) for grades 2 and 3 obesity. These findings persisted when limited to studies with measured weight and height that were considered to be adequately adjusted. The HRs tended to be higher when weight and height were self-reported rather than measured.

Conclusions and Relevance Relative to normal weight, both obesity (all grades) and grades 2 and 3 obesity were associated with significantly higher all-cause mortality. Grade 1 obesity overall was not associated with higher mortality, and overweight was associated with significantly lower all-cause mortality. The use of predefined standard BMI groupings can facilitate between-study comparisons.

JAMA. 2013;309(1):71-82 www.jama.com

From Flegal KM et al. JAMA 2013;309:71-82

Hazard ratios for all-cause mortality relative to normal weight



Adapted from Flegal KM JAMA 2013;309:71-82

Ditch the gym? Overweight people may outlive everyone else, study finds.

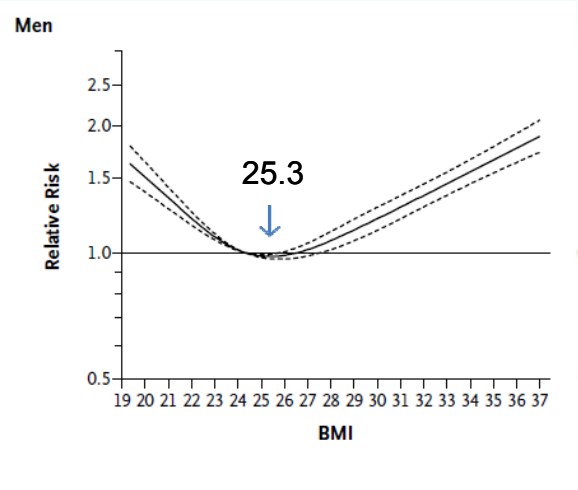
Madeleine White
The Globe and Mail
Published Wednesday, Jan. 02 2013, 11:54 AM EST
Last updated Thursday, Jan. 03 2013, 10:35 AM EST

Modulators of BMI-related mortality risk

- sex
- age
- race
- body composition (muscle mass)
- body fat distribution
- physical activity/fitness
- nutritional quality
- disease
- more aggressive management of risk factors among overweight/obese patients?
- greater morbidity not captured by mortality data
- **BMI range of the reference group: (include higher risk BMI values:18.5-22 kg/m^2)**

Heymsfield SB, Cefalu WT. JAMA 2013;309:87-8

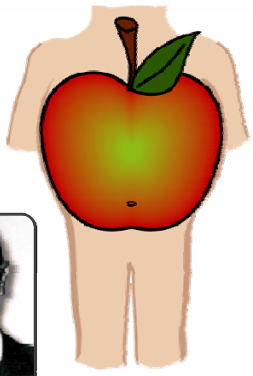
Relative risk of death among men (n=125,000) of the European Prospective Investigation into Cancer and Nutrition (EPIC) study according to BMI (9.7 yr follow-up)



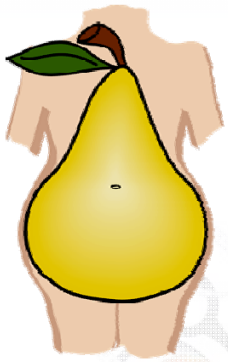
Adapted from Pischon T et al. N Engl J Med 2008;359:2105-20

Hommage à un grand homme…

Jean Vague MD



Élevé



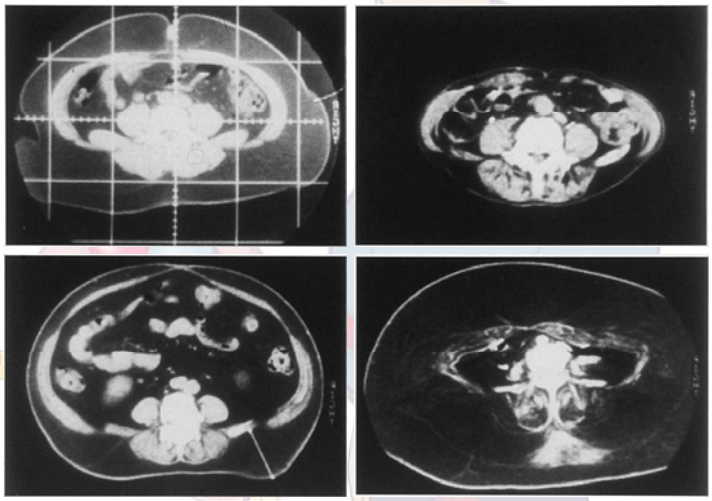
Faible

RISQUE

Vague J, Presse Méd, 1947

Dr. Yuji Matsuzawa
Dept. of Internal Medicine, University of Osaka, JAPAN

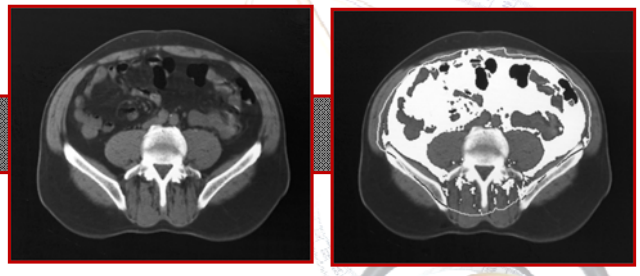
L'arrivée des techniques d'imagerie: une révolution…



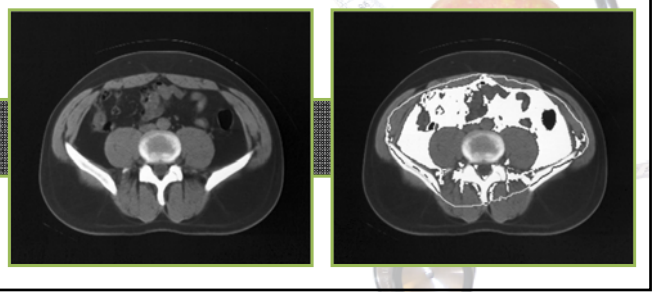
From Tokunaga K et al. Int J Obes 1983; 7: 437-45

Nos premiers résultats…il y a 28 ans!!!

Masse grasse : 19.8 kg
TA viscéral : 155 cm^2



Masse grasse : 19.8 kg
TA viscéral : 96 cm^2



L'obésité viscérale : un concept développé à l'Université Laval il y a près de 25 ans…

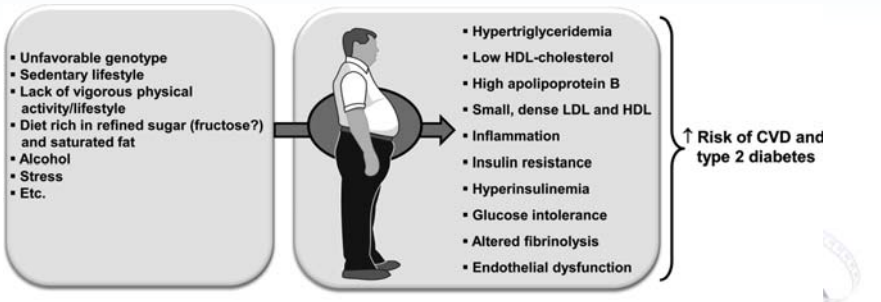
Review

Regional Distribution of Body Fat, Plasma Lipoproteins, and Cardiovascular Disease

Jean-Pierre Després, Sital Moorjani, Paul J. Lupien, Angelo Tremblay, André Nadeau, and Claude Bouchard

Several epidemiological studies have reported that the regional distribution of body fat is a significant and independent risk factor for cardiovascular disease (CVD) and related mortality. Although these associations are well established, the causal mechanisms are not fully understood. Numerous studies have, however, shown that specific topographic features of adipose tissue are associated with metabolic complications that are considered as risk factors for CVD such as insulin resistance, hyperinsulinemia, glucose intolerance and type II diabetes mellitus, hypertension, and changes in the concentration of plasma lipids and lipoproteins. The present article summarizes the evidence on the metabolic correlates of body fat distribution. Potential mechanisms for the association between body fat distribution, metabolic complications, and CVD are reviewed, with an emphasis on plasma lipoprotein levels and plasma lipid transport. From the evidence available, it seems likely that subjects with visceral obesity represent the subgroup of obese individuals with the highest risk for CVD. Although body fat distribution is now considered as a more significant risk factor for CVD and related death rate than obesity per se, further research is clearly needed to identify the determinants of body fat distribution and the causal mechanisms involved in the metabolic alterations. It appears certain, however, that an altered plasma lipid transport is a significant component of the relation between body fat distribution and CVD. (Arteriosclerosis 10:497–511, July/August 1990)

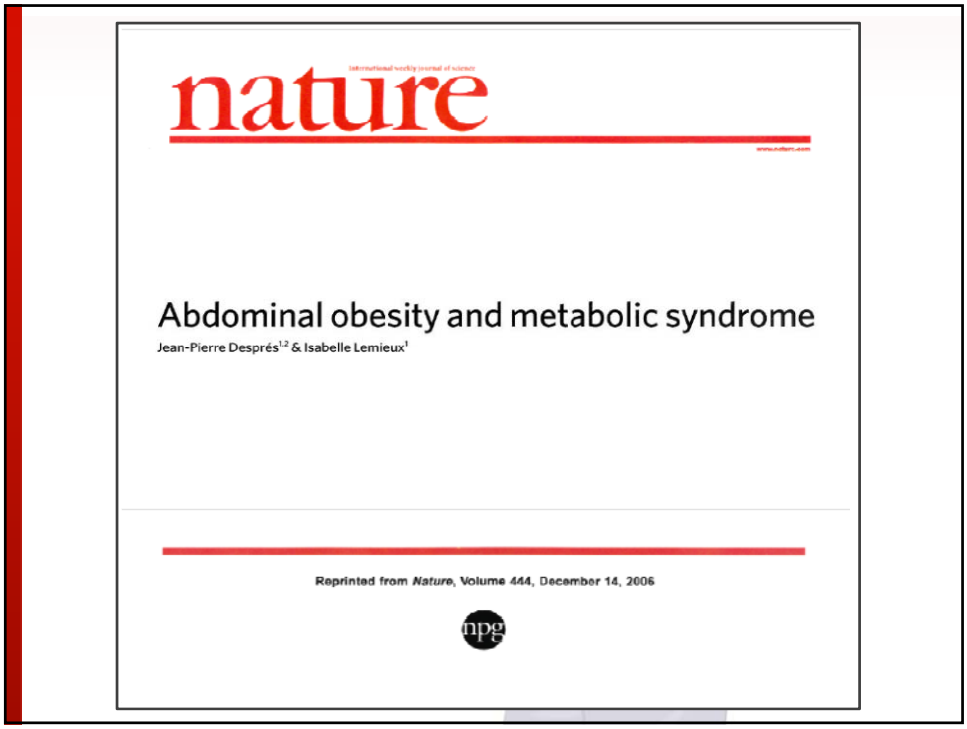
Some of the alterations in the metabolic risk profile that have been found to be related to abdominal obesity assessed by anthropometry and later to excess visceral adiposity/ectopic fat assessed by imaging techniques

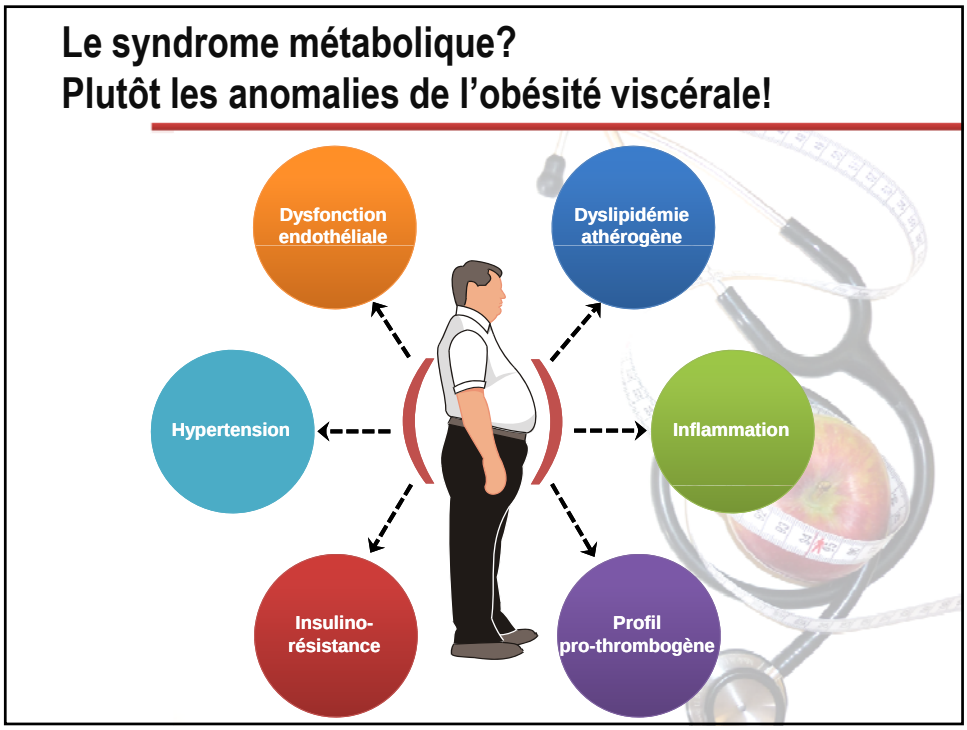


SYNDROME X (REAVEN'S SYNDROME)?
INSULIN RESISTANCE SYNDROME?
METABOLIC SYNDROME?
EXCESS VISCERAL/ECTOPIC FAT?

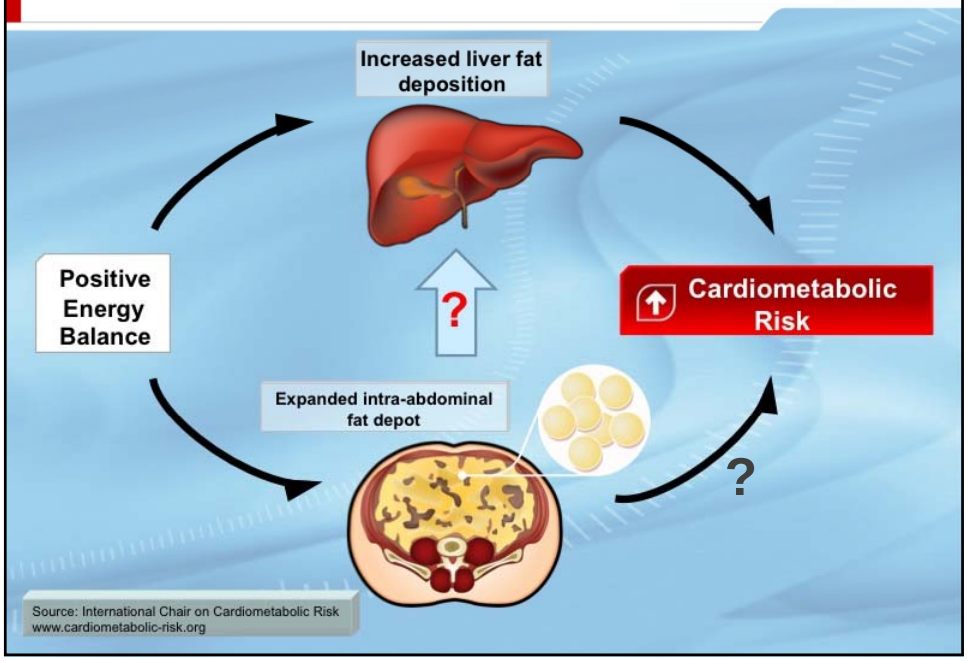
American Heart Association
Learn and Live

Després JP Circulation 2012;126:1301-13


nature
Abdominal obesity and metabolic syndrome
Jean-Pierre Després[1,2] & Isabelle Lemieux[1]
Reprinted from Nature, Volume 444, December 14, 2006
npg


Le syndrome métabolique?
Plutôt les anomalies de l'obésité viscérale!
Dysfonction endothéliale
Dyslipidémie athérogène
Hypertension
Inflammation
Insulino-résistance
Profil pro-thrombogène

Le tissu adipeux viscéral: un marqueur ou un acteur?



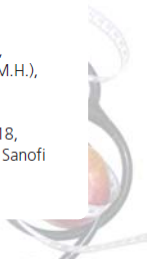
ORIGINAL ARTICLE

Endocrine Care

Visceral Adipose Tissue Indicates the Severity of Cardiometabolic Risk in Patients with and without Type 2 Diabetes: Results from the INSPIRE ME IAA Study

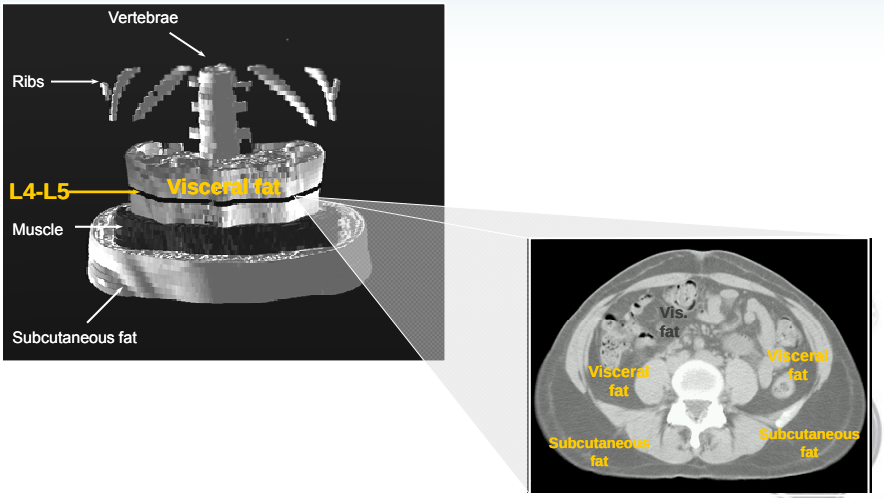
Jessica D. Smith, Anne-Laure Borel, Julie-Anne Nazare, Steven M. Haffner, Beverley Balkau, Robert Ross, Christine Massien, Natalie Alméras, and Jean-Pierre Després

Centre de recherche de l'Institut universitaire de cardiologie et de pneumologie de Québec (J.D.S., A.-L.B., J.-A.N., N.A., J.-P.D.), Québec, Québec, Canada G1V 4G5; Baylor College of Medicine (S.M.H.), Houston, Texas 77030; Institut National de la Santé et de la Recherche Médicale (B.B.), Center for Research in Epidemiology and Population Health, Epidemiology of Diabetes, Obesity, and Chronic Kidney Disease over the Lifecourse, University Paris Sud 11, Unité mixte de recherche en santé 1018, F-94807, Villejuif, France; and Queen's University (R.R.), Kingston, Ontario, Canada K7L 3N6; and Sanofi (C.M.), F-75013 Paris, France



Smith JD et al. J Clin Endocrinol Metab 2012;97:1517-25

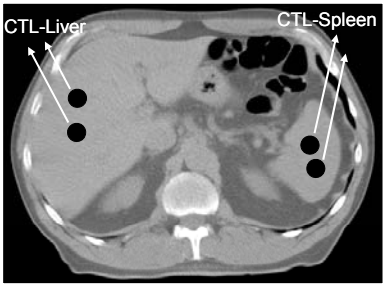
Visceral adipose tissue measurement (n = 4277 men and women)



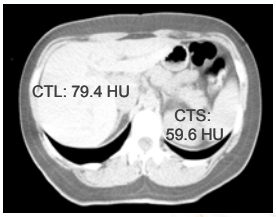
L4-L5 inter-vertebral space

Liver fat measurement (Th12-L1) (n = 4277 men and women)

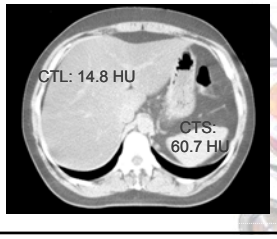
Liver fat



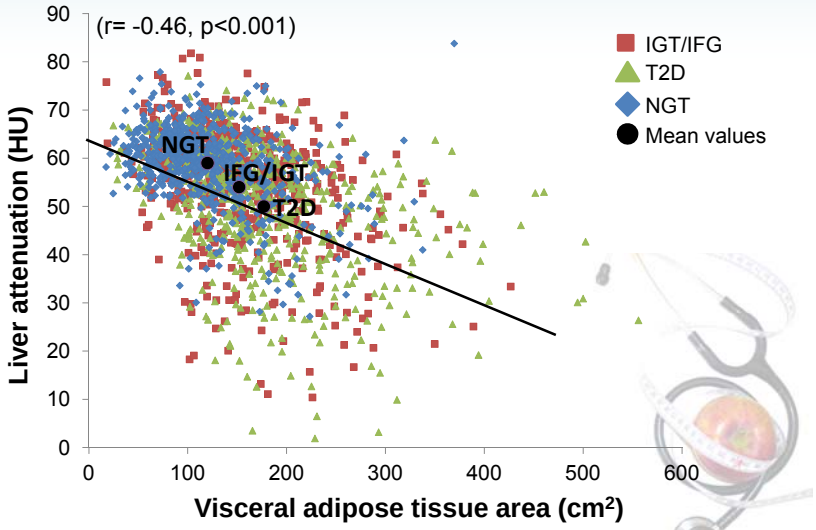
Subject A – Lean liver
CTL/CTS : 1.33



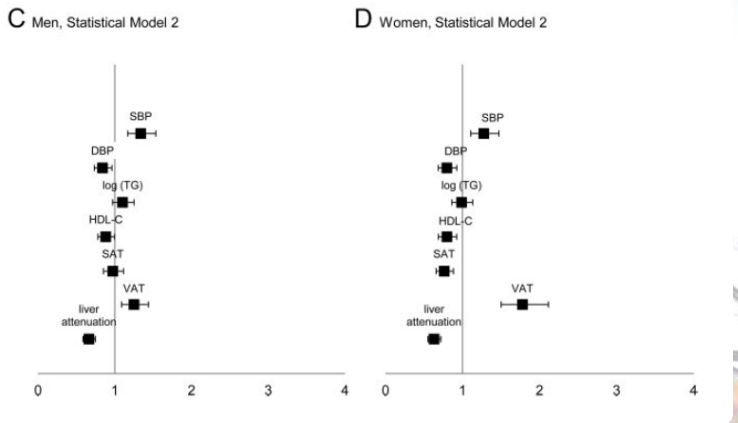
Subject B – Fatty liver
CTL/CTS : 0.24



Relationship between visceral adipose tissue and liver attenuation according to glucose tolerance status in women The INSPIRE ME IAA



Odds ratios for type 2 diabetes associated with a 1-SD change in cardiometabolic risk factors



Men and women report odds ratios after adjustment for one another as well as for the following confounding variables: age, geographical region, and recruiting physician's specialty.

Smith JD et al. J Clin Endocrinol Metab 2012; 97: 1517-25

ORIGINAL CONTRIBUTION

CLINICIAN'S CORNER

Dysfunctional Adiposity and the Risk of Prediabetes and Type 2 Diabetes in Obese Adults

Ian J. Neeland, MD
Aslan T. Turer, MD, MHS
Colby R. Ayers, MS
Tiffany M. Powell-Wiley, MD, MPH
Gloria L. Vega, PhD
Ramin Farzaneh-Far, MD, MAS
Scott M. Grundy, MD, PhD
Amit Khera, MD, MS
Darren K. McGuire, MD, MHSc
James A. de Lemos, MD

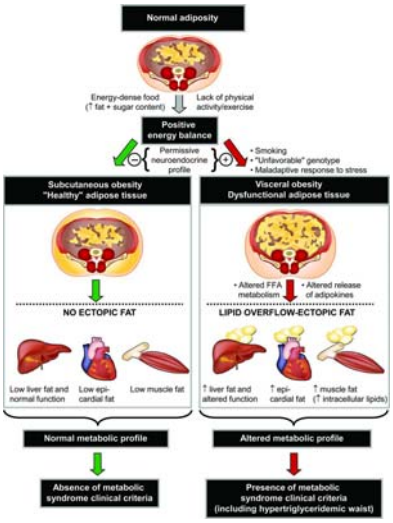
Context The risk of type 2 diabetes mellitus is heterogeneous among obese individuals. Factors that discriminate prediabetes or diabetes risk within this population have not been well characterized. A dysfunctional adiposity phenotype, characterized by excess visceral fat and insulin resistance, may contribute to diabetes development in those with obesity.

Objective To investigate associations between adiposity phenotypes and risk for incident prediabetes and diabetes in a multiethnic, population-based cohort of obese adults.

Design, Setting, and Participants Among 732 obese participants (body mass index ≥30) aged 30 to 65 years without diabetes or cardiovascular disease enrolled between 2000 and 2002 in the Dallas Heart Study, we measured body composition by dual energy x-ray absorptiometry and magnetic resonance imaging (MRI); circulating adipokines and biomarkers of insulin resistance, dyslipidemia, and inflammation; and subclinical atherosclerosis and cardiac structure and function by computed tomogra-

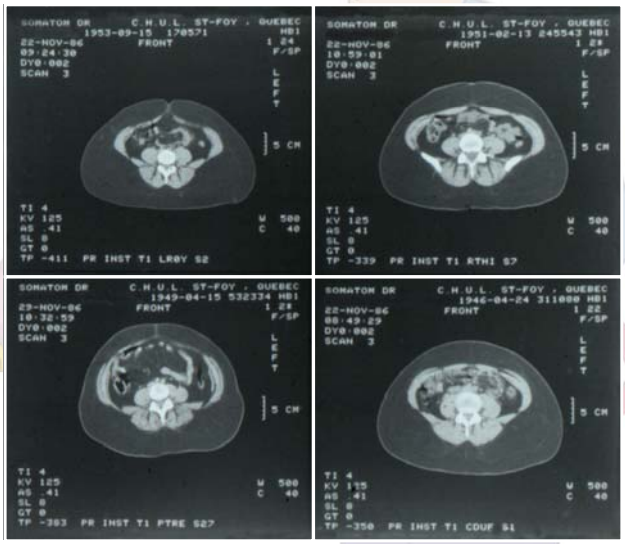
From Neeland IJ et al.
JAMA (2012) 308: 1150-1159

The lipid overflow-ectopic fat model.

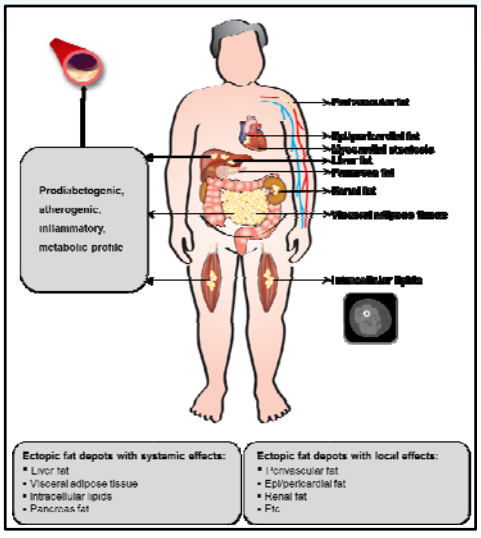


Després JP Circulation 2012;126:1301-1313

L'obésité massive (BMI>40 kg/m^2) sans anomalies métaboliques s'explique maintenant…

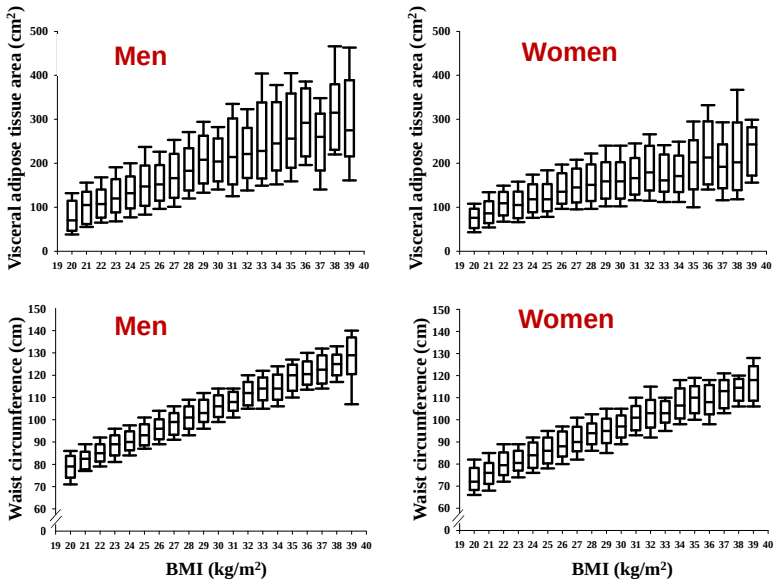


L'adiposité viscérale/les lipides ectopiques modulent le risque cardiométabolique chez les patients en surpoids/obèses!



From Després JP. Circulation 2012;126:1301-13

Grande variabilité dans l'adiposité viscérale pour un même IMC



De: Nazare, JA, et al. Am J Cardiol, sous presse

INSPIRE ME IAA

Le tour de taille…

…un signe vital!

Waist Circumference and Abdominal Sagittal Diameter: Best Simple Anthropometric Indexes of Abdominal Visceral Adipose Tissue Accumulation and Related Cardiovascular Risk in Men and Women

Marie-Christine Pouliot, MSc, Jean-Pierre Després, PhD, Simone Lemieux, MSc, Sital Moorjani, PhD, Claude Bouchard, PhD, Angelo Tremblay, PhD, André Nadeau, MD, PhD, and Paul J. Lupien, MD, PhD

Reprinted from the March 1 issue

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73:460-468,1994

Le tour de taille ne remplace pas mais ajoute de l'information au-delà de l'IMC

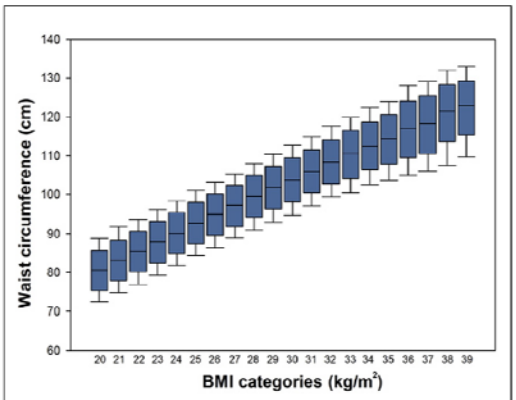


Figure 1 **Waist and BMI Are Not Interchangeable at the Individual/Patient Level**

Box-and-whisker plots showing the distribution of waist circumference values (age adjusted) per unit of body mass index (BMI) in the subsample of 64,624 men of the IDEA (International Day for the Evaluation of Abdominal Obesity) study (20) who had BMI values ≥20 and <40 kg/m². Data shown are medians, quartiles, and 10th and 90th percentiles.

Conclusions:

1. **Le tour de taille et l'IMC sont fortement corrélés.**
2. **Une forte variation du tour de taille pour un IMC donné est observée.**
3. **On doit ajouter la mesure du le tour de taille à celle de l'IMC.**

Després JP. JACC, 2011;57:1877-9

MAYO CLINIC

ORIGINAL ARTICLE

A Pooled Analysis of Waist Circumference and Mortality in 650,000 Adults

James R. Cerhan, MD, PhD; Steven C. Moore, PhD; Eric J. Jacobs, PhD; Cari M. Kitahara, PhD; Philip S. Rosenberg, PhD; Hans-Olov Adami, MD, PhD; Jon O. Ebbert, MD; Dallas R. English, PhD; Susan M. Gapstur, PhD; Graham G. Giles, PhD; Pamela L. Horn-Ross, PhD; Yikyung Park, PhD; Alpa V. Patel, PhD; Kim Robien, PhD; Elisabete Weiderpass, PhD; Walter C. Willett, PhD; Alicja Wolk, PhD; Anne Zeleniuch-Jacquotte, PhD; Patricia Hartge, PhD; Leslie Bernstein, PhD; and Amy Berrington de Gonzalez, PhD

Abstract

Objectives: To assess the independent effect of waist circumference on mortality across the entire body mass index (BMI) range and to estimate the loss in life expectancy related to a higher waist circumference.
Patients and Methods: We pooled data from 11 prospective cohort studies with 650,386 white adults aged 20 to 83 years and enrolled from January 1, 1986, through December 31, 2000. We used proportional hazards regression to estimate hazard ratios (HRs) and 95% CIs for the association of waist circumference with mortality.
Results: During a median follow-up of 9 years (maximum, 21 years), 78,268 participants died. After accounting for age, study, BMI, smoking status, alcohol consumption, and physical activity, a strong

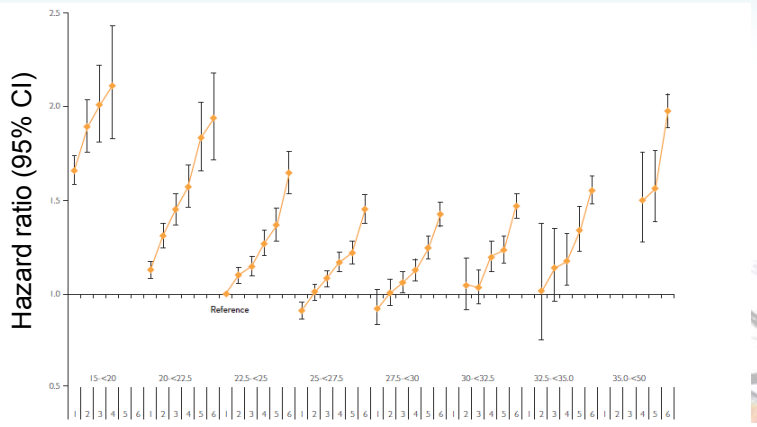
From Cerhan JR et al.
Mayo Clin Proc (2014) 89:335-345

Characteristics of the study

- 650,386 individuals from 11 cohorts
  - 379,823 women
  - 270,563 men
- Non-Hispanic white subjects
- Aged 20-84 years
- BMI 15.0-50 kg/m^2
- Waist 51-190 cm
- Median follow-up of 9 years
- 78,268 deaths including 28,917 from cancer, 24,411 from CVD and 6202 from respiratory disease

From Cerhan JR et al.
Mayo Clin Proc (2014) 89:335-345

Hazard ratios for waist circumference in 5-cm increments and all-cause mortality by BMI category



Adjusted for educational level, marital status, smoking status, alcohol consumption, physical activity and BMI.

From Cerhan JR et al.
Mayo Clin Proc (2014) 89:335-345

Comment estimer l'adiposité viscérale/graisse ectopique en clinique?

Étape 1 :
Mesurer l'IMC

Étape 2
Mesurer le tour de taille

Étape 3 :
Mesurer les triglycérides

Després JP et al. Arterioscler Thromb Vasc Biol 2008 ; 28 : 1039-49

La taille hypertriglycéridémiante comme outil de dépistage de l'obésité viscérale

	Circonférence de taille*	+	Triglycérides*	
Bon	< 90 cm		< 2.0 mmol/l	~10 %
Mauvais	≥ 90 cm		≥ 2.0 mmol/l	~80 %

* 85 cm et 1.5 mmol/L chez la femme

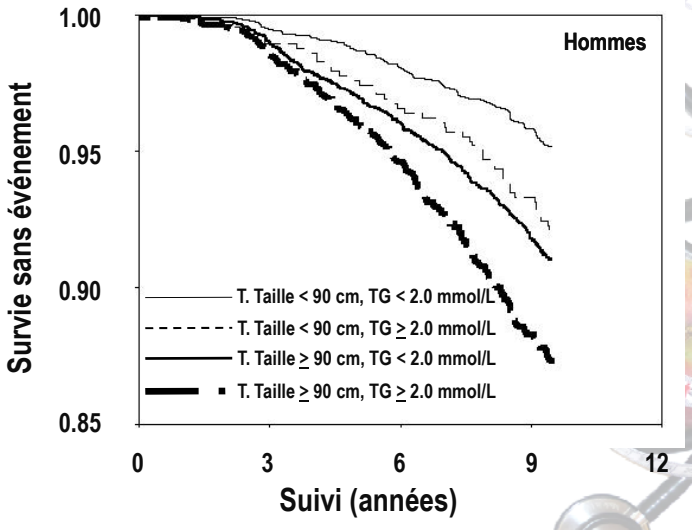
Adapté de Lemieux I et al. Circulation 2000 ; 102 : 179-84

La taille hypertriglycéridémiante et le risque coronarien dans l'étude EPIC-Norfolk

- European Prospective Investigation into Cancer and nutrition-Norfolk study
- 21,758 individus (9,496 hommes et 12,262 femmes) âgés de 45 à 79 ans
- 1387 événements coronariens (854 hommes et 533 femmes)
- Suivi moyen 8,2 ± 1,4 années
- Investigateurs : Wareham NJ, Khaw KT (Cambridge)
- Co-investigateurs : Kastelein JJP, Boekholdt SM (Amsterdam)

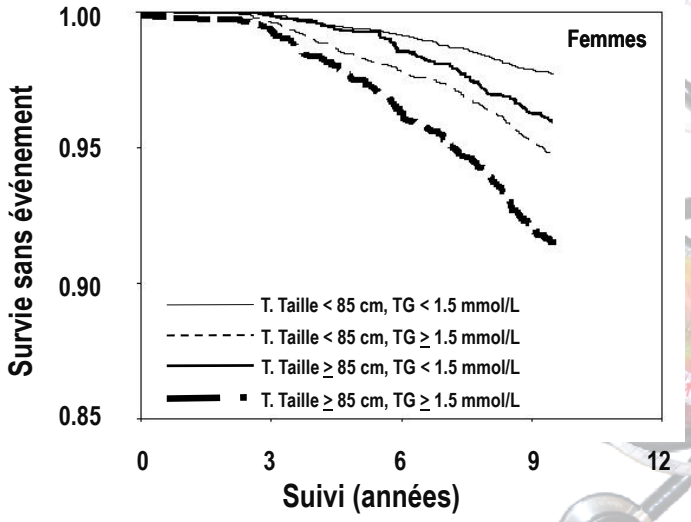
Arsenault B et al. CMAJ 2010 ; 183 : 1427-32

Courbes de survie Kaplan-Meir en fonction des sous-groupes de taille hypertriglycéridémiante chez les hommes (1993-2003)



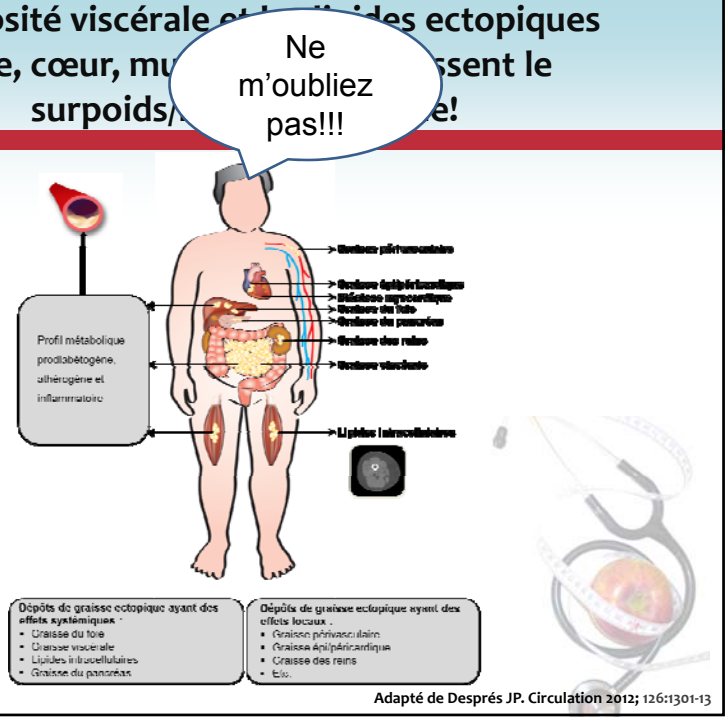
Adapté de Arsenault B et al. CMAJ 2010 ; 183 : 1427-32

Courbes de survie Kaplan-Meir en fonction des sous-groupes de taille hypertriglycéridémiante chez les femmes (1993-2003)



Adapté de Arsenault B et al. CMAJ 2010 ; 183 : 1427-32

L'adiposité viscérale et [illegible] ectopiques (foie, cœur, mu[illegible]ssent le surpoids/[illegible]e!



Adapté de Després JP. Circulation 2012; 126:1301-13

L'épidémie d'obésité/diabète: au-delà des maladies cardiovasculaires…

- Impact sur les modifications structurales et fonctionnelles au cerveau ayant des impacts cognitifs
- Démence, maladie d'Alzheimer: Coûts prohibitifs
- En 2008: 500,000 individus souffrantde démence au Canada
- Coûts: 15 milliards $... 75 milliards $ in 2028
- Nous avons un urgent besoin d'interventions et de mesures préventives peu coûteuses

Visceral Fat Is Associated with Lower Brain Volume in Healthy Middle-Aged Adults

Stéphanie Debette, MD, PhD,[1,2] Alexa Beiser, PhD,[1,2,3] Udo Hoffmann, MD,[4,5] Charles DeCarli, MD,[6] Christopher J. O'Donnell, MD, MPH,[2,7] Joseph M. Massaro, PhD,[2,3] Rhoda Au, PhD,[1,2] Jayandra J. Himali, MS,[1,2,3] Philip A. Wolf, MD,[1,2] Caroline S. Fox, MD, MPH,[2,4] and Sudha Seshadri, MD, DM[1,2]

Objective: Midlife obesity has been associated with an increased risk of dementia. The underlying mechanisms are poorly understood. Our aim was to examine the cross-sectional association of body mass index (BMI), waist circumference (WC), waist-to-hip ratio (WHR), and computed tomography (CT)-based measurements of subcutaneous (SAT) and visceral (VAT) adipose tissue with various magnetic resonance imaging (MRI) markers of brain aging in middle-aged community adults.
Methods: Participants from the Framingham Offspring cohort were eligible if in addition to having measurements of BMI, WC, WHR, SAT, and VAT, they had undergone a volumetric brain MRI scan with measurements of total brain volume (TCBV), temporal horn volume (THV), white matter hyperintensity volume (WMHV), and MRI-defined brain infarcts (BI). All analyses were adjusted for age, sex, and time interval between abdominal CT and brain MRI.
Results: In a sample of 733 community participants (mean age, 60 years; 53% women), we observed an inverse association of BMI (estimate by standard deviation unit ± standard error = −0.27 ± 0.12; $p = 0.02$), WC (−0.30 ± 0.12; $p = 0.01$), WHR (−0.37 ± 0.12; $p = 0.02$), SAT (−0.23 ± 0.11; $p = 0.04$), and VAT (−0.36 ± 0.12; $p = 0.002$) with TCBV, independent of vascular risk factors. The association between VAT and TCBV was the strongest and most robust, and was also independent of BMI (−0.35 ± 0.15; $p = 0.02$) and insulin resistance (−0.32 ± 0.13; $p = 0.01$). When adjusting for C-reactive protein levels, the associations were attenuated (−0.17 ± 0.13; $p = 0.17$ for VAT). No consistently significant association was observed between the anthropometric or CT-based abdominal fat measurements and THV, WMHV, or BI.
Interpretation: In middle-aged community participants, we observed a significant inverse association of anthropometric and CT-based measurements of abdominal, especially visceral, fat with total brain volume.
ANN NEUROL 2010;68:136–144

From Debette S et al.
Ann Neurol 2010;68:136-144

PEDIATRIC ORIGINAL ARTICLE

Visceral fat is associated with lower executive functioning in adolescents

DH Schwartz[1,2], G Leonard[3], M Perron[4], L Richer[4], C Syme[5], S Veillette[4,6], Z Pausova[5] and T Paus[1,2,3]

BACKGROUND: Obesity, a major risk factor for cardiometabolic disease, is associated with lower cognitive performance from childhood to senescence, especially on tasks of executive function. In the cardiovascular domain, fat stored viscerally rather than elsewhere in the body carries particularly high risk. It is unknown whether this is also true in case of obesity–cognition relationships. The aim of this study was to assess the cross-sectional relationship between visceral fat (VF) and cognitive performance in a community sample of healthy adolescents.
METHODS: In a community-based sample of 983 adolescents (12–18 years old, 480 males), VF was quantified using magnetic resonance imaging, total body fat was measured using a multifrequency bioimpedance, and cognitive performance was assessed using a battery of cognitive tests measuring executive function and memory.
RESULTS: We found that larger volumes of VF were associated with *lower* performance on six measures of executive function ($P = 0.0001–0.02$). We also found that the association of VF with executive function was moderated by sex for a subset of measures, such that relationship was present mainly in female subjects and not in male subjects (sex-by-VF interaction: $P = 0.001–0.04$). These relationships were independent of the quantity of total body fat and a number of potential confounders, including age, puberty stage and household income.
CONCLUSIONS: Our results suggest that the adverse association between obesity and executive function may be attributed to fat stored viscerally and not to fat stored elsewhere in the body. They also suggest that female subjects compared with male subjects may be more sensitive to the potentially detrimental effects of VF on cognition.

International Journal of Obesity (2013) **37,** 1336–1343; doi:10.1038/ijo.2013.104

Keywords: visceral fat; intra-abdominal fat; total body fat; executive functioning; adolescence

From Schwartz DH et al.
Int J Obes 2013;37:1336-1343

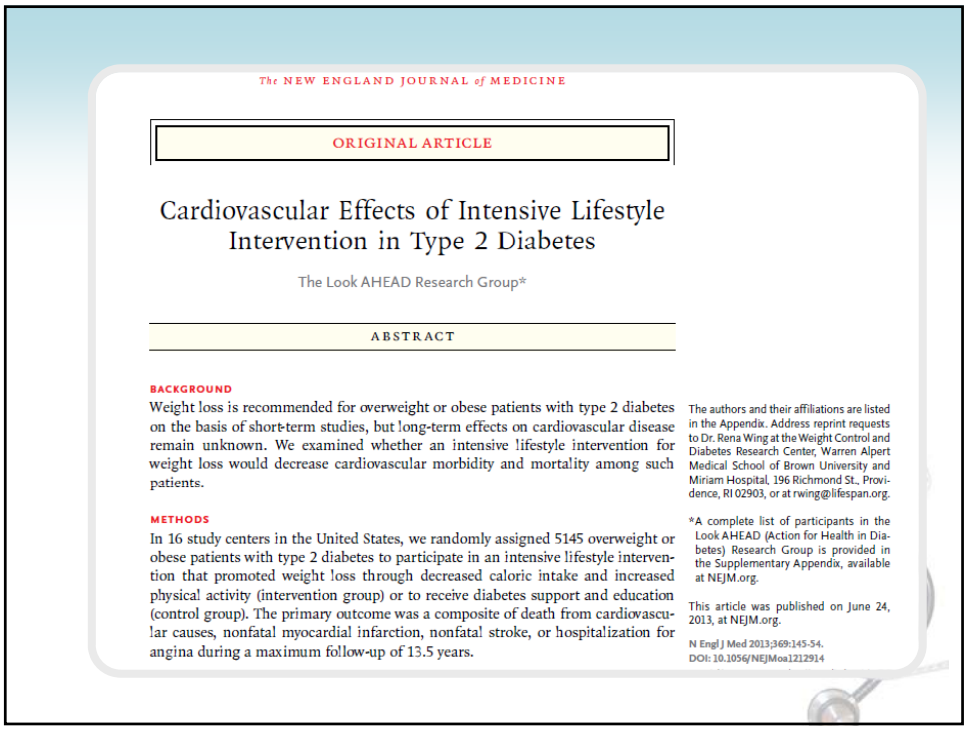
L'obésité viscérale et la santé du cerveau

- **Diminution du volume du cerveau**
- **Perte de tissu cérébral du cortex**

  (Cortex frontal and hippocampe)
- **Perte de matière grise**
- **Déclin de la fonction cognitive**

Prise en charge de l'obésité et du diabète de type 2

Est-ce que la perte de poids est la bonne cible?



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Cardiovascular Effects of Intensive Lifestyle Intervention in Type 2 Diabetes

The Look AHEAD Research Group*

ABSTRACT

BACKGROUND

Weight loss is recommended for overweight or obese patients with type 2 diabetes on the basis of short-term studies, but long-term effects on cardiovascular disease remain unknown. We examined whether an intensive lifestyle intervention for weight loss would decrease cardiovascular morbidity and mortality among such patients.

METHODS

In 16 study centers in the United States, we randomly assigned 5145 overweight or obese patients with type 2 diabetes to participate in an intensive lifestyle intervention that promoted weight loss through decreased caloric intake and increased physical activity (intervention group) or to receive diabetes support and education (control group). The primary outcome was a composite of death from cardiovascular causes, nonfatal myocardial infarction, nonfatal stroke, or hospitalization for angina during a maximum follow-up of 13.5 years.

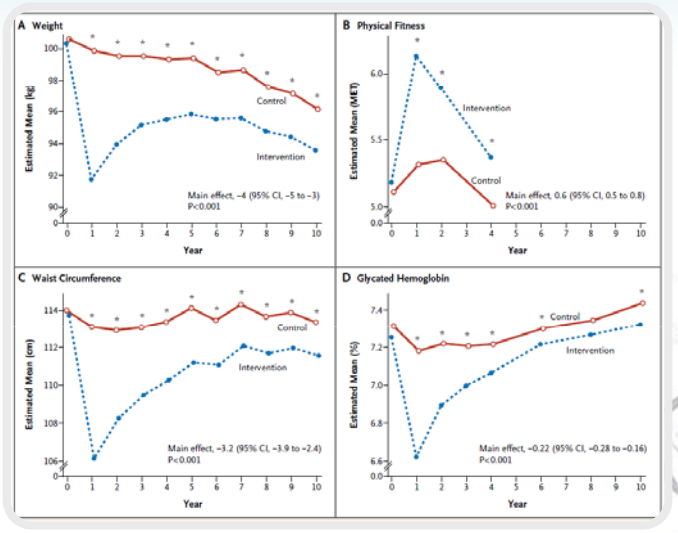
The authors and their affiliations are listed in the Appendix. Address reprint requests to Dr. Rena Wing at the Weight Control and Diabetes Research Center, Warren Alpert Medical School of Brown University and Miriam Hospital, 196 Richmond St., Providence, RI 02903, or at rwing@lifespan.org.

*A complete list of participants in the Look AHEAD (Action for Health in Diabetes) Research Group is provided in the Supplementary Appendix, available at NEJM.org.

This article was published on June 24, 2013, at NEJM.org.

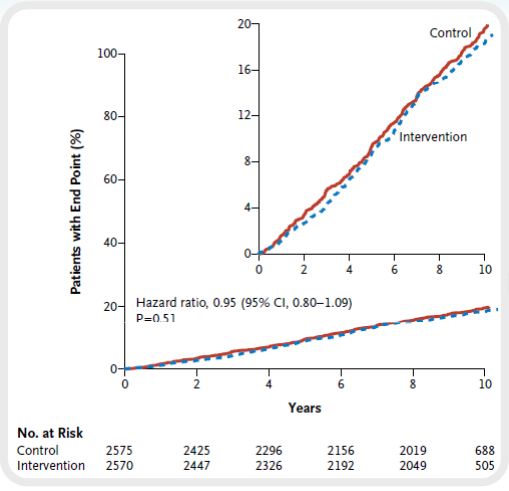
N Engl J Med 2013;369:145-54.
DOI: 10.1056/NEJMoa1212914

Changes in Weight, Physical Fitness, Waist Circumference and Glycated Hemogobin Levels During 10 Years of Follow-Up



The Look AHEAD Research Group N Engl J Med 2013;369:145-54

Cumulative Hazard Curves for the Primary Composite Endpoint



The Look AHEAD Research Group N Engl J Med 2013;369:145-54

PREDIMED: An Example of a Simple Nutritional Intervention Not Aiming at Weight Loss as the Primary Endpoint

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Primary Prevention of Cardiovascular Disease with a Mediterranean Diet

Ramón Estruch, M.D., Ph.D., Emilio Ros, M.D., Ph.D., Jordi Salas-Salvadó, M.D., Ph.D., Maria-Isabel Covas, D.Pharm., Ph.D., Dolores Corella, D.Pharm., Ph.D., Fernando Arós, M.D., Ph.D., Enrique Gómez-Gracia, M.D., Ph.D., Valentina Ruiz-Gutiérrez, Ph.D., Miquel Fiol, M.D., Ph.D., José Lapetra, M.D., Ph.D., Rosa Maria Lamuela-Raventos, D.Pharm., Ph.D., Lluís Serra-Majem, M.D., Ph.D., Xavier Pintó, M.D., Ph.D., Josep Basora, M.D., Ph.D., Miguel Angel Muñoz, M.D., Ph.D., José V. Sorlí, M.D., Ph.D., José Alfredo Martínez, D.Pharm, M.D., Ph.D., and Miguel Angel Martínez-González, M.D., Ph.D., for the PREDIMED Study Investigators*

ABSTRACT

BACKGROUND

Observational cohort studies and a secondary prevention trial have shown an inverse association between adherence to the Mediterranean diet and cardiovascular risk. We conducted a randomized trial of this diet pattern for the primary prevention of cardiovascular events.

N=7447 subjects

Age: 67 years

(57% women)

BMI: 30 kg/m²

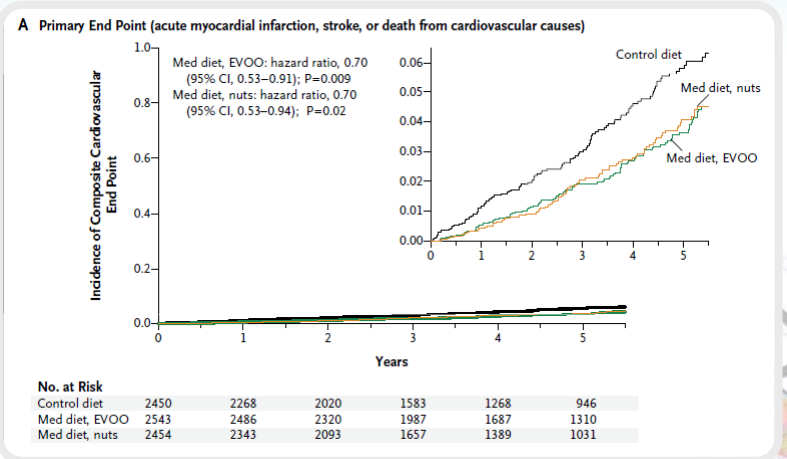
Waist: 100 cm

50% had type 2 diabetes

Follow-up: 4.8 years

From Estruch, R. et al. N Engl J Med 2013; 368:1279-90

Kaplan-Meier Estimates of the Incidence of the Primary Endpoint

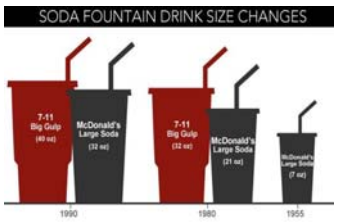


Primary endpoint: a composite of acute myocardial infarction, stroke, and death from CVD

From Estruch, R. et al. N Engl J Med 2013; 368:1279-90

L'activité physique: Bénéfique pour la santé bien au-delà de la perte de poids…

Le patient avec obésité abdominale et « syndrome métabolique »: tenir compte de la sédentarité dans l'évaluation du risque global…



European Journal of Cardiovascular Prevention & Rehabilitation

Original scientific paper

European Journal of Cardiovascular Prevention & Rehabilitation
18(2) 209–217

DOI: 10.1177/1741826710389397
ejcpr.sagepub.com
SAGE

Physical activity, metabolic syndrome, and coronary risk: the EPIC–Norfolk prospective population study

Lysette N Broekhuizen[1], S Matthijs Boekholdt[1,2], Benoit J Arsenault[3], Jean–Pierre Despres[3], Erik SG Stroes[1], John JP Kastelein[1], Kay–Tee Khaw[4] and Nicholas J Wareham[5]

Abstract

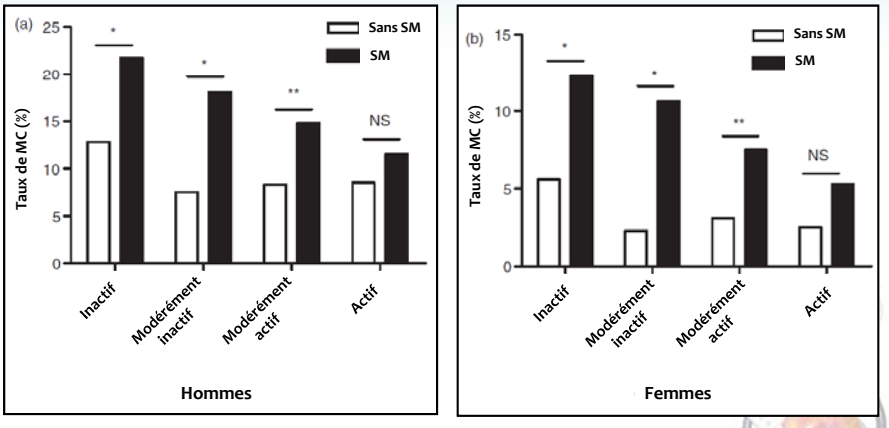
Objective: We investigated the association between physical activity, metabolic syndrome (MS), and the risk of future coronary heart disease (CHD) and mortality due to CHD in middle–aged men and women.

Design: Prospective cohort study.

Subjects: A total of 10,134 men and women aged 45–79 years at baseline, were selected from the European Prospective Investigation into Cancer and Nutrition (EPIC)–Norfolk cohort. Cardiovascular risk factors and physical activity levels were recorded at baseline. Rates of CHD and CHD mortality were recorded during a follow–up of 10.9 years.

Results: The prevalence of MS was 37.6% in men and 30.2% in women. Hazard ratios (HRs) for future CHD were 1.95 (95% CI 1.65–2.31) for men with MS and 3.17 (95% CI 2.53–3, 97) for women with MS, compared to those without MS. HRs adjusted for age and smoking were 1.52 (95% CI 1.29–1.81) for men and 1.76 (95% CI 1.39–2.23) for women. Additional adjustment for physical activity did not attenuate these risk estimates further [HRs 1.51 (95% CI 1.27–1.79) and 1.74 (95% CI 1.38–2.21), respectively]. CHD risk associated with MS was substantially lower among participants who

Le patient avec obésité abdominale : l'activité physique réduit le risque de maladie coronarienne de 50 % !!!



MC : maladies coronariennes
SM : obésité abdominale et syndrome métabolique

Broekhuizen LN et al. Eur J Cardiovasc Prev Rehab 2011;18:209-17

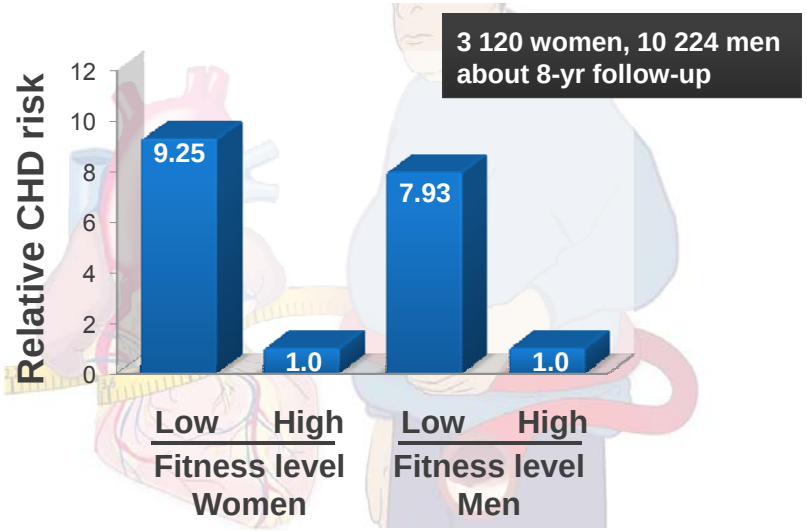
La sédentarité/activité physique: Si c'est important, il faut la mesurer en clinique!

La condition cardio-respiratoire: Le facteur de risque le plus puissant?

Dr. Steven N. Blair

Dr. Tim Church

Relative CHD Risk in the Cooper Clinic According to the Fitness Level



Adapted from Blair SN et al. JAMA 1989;262:2395-2401

ORIGINAL INVESTIGATION

Cardiorespiratory Fitness and Body Mass Index as Predictors of Cardiovascular Disease Mortality Among Men With Diabetes

Timothy S. Church, MD, MPH, PhD; Michael J. LaMonte, PhD; Carolyn E. Barlow, MS; Steven N. Blair, PED

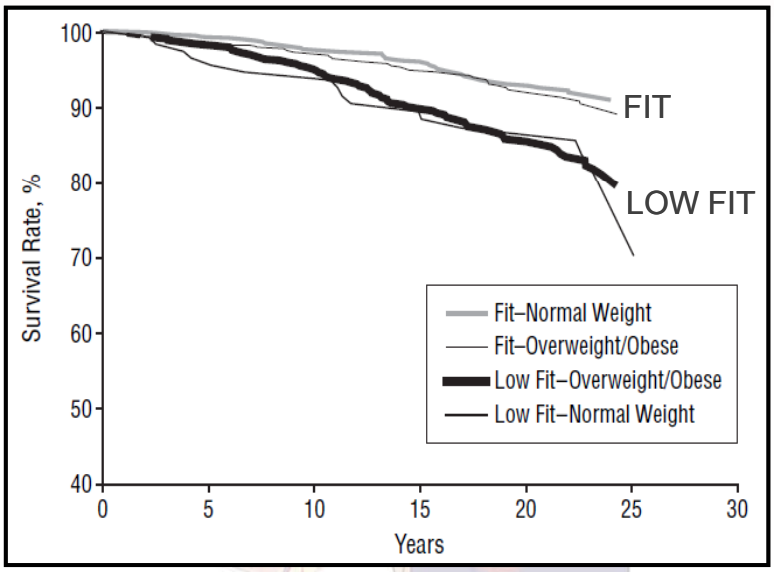
Background: Questions remain as to whether higher levels of cardiorespiratory fitness, a measure of regular physical activity, are associated with lower risk of cardiovascular disease (CVD) mortality in overweight and obese individuals with diabetes. Our objective was to quantify the independent and joint relations of cardiorespiratory fitness (hereafter, fitness) and body mass index (BMI; calculated as weight in kilograms divided by the square of height in meters) with CVD mortality in men with diabetes.

Methods: This study was conducted using prospective observational data from the Aerobics Center Longitudinal Study. Study participants comprised 2316 men with no history of stroke or myocardial infarction and who were diagnosed as having diabetes (mean [SD] age, 50 [10] years); had a medical examination, including a maximal exercise test during 1970 to 1997 with mortality surveillance to December 31, 1998; and had a BMI of 18.5 or greater and less than 35.0. The main outcome measure was CVD mortality across levels of fitness with stratification by BMI.

Results: We identified 179 CVD deaths during a mean (SD) follow-up of 15.9 (7.9) years and 36 710 man-years of exposure. In a model containing age, examination year, fasting glucose level, systolic blood pressure, parental history of premature CVD, total cholesterol level, cigarette smoking, abnormal resting, and exercise electrocardiograms, a significantly higher adjusted risk of mortality was observed in men with a low fitness level who were normal weight (hazard ratio, 2.7 [95% confidence interval, 1.3-5.7]), overweight (hazard ratio, 2.7 [95% confidence interval, 1.4-5.1]), and class 1 obese (hazard ratio, 2.8 [95% confidence interval, 1.4-5.1]) compared with normal weight men with a high fitness level.

Conclusion: In this cohort of men with diabetes, low fitness level was associated with increased risk of CVD mortality within normal weight, overweight, and class 1 obese weight categories.

Arch Intern Med. 2005;165:2114-2120

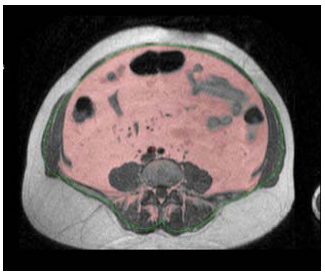


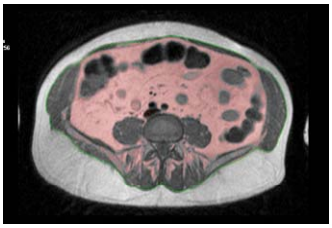
From Church et al. Arch Intern Med 2005;165:2114-20

Le concept de l'individu « fat and fit »

Comment l'expliquer?

Effet d'un programme de modification des habitudes alimentaires et d'activité physique chez un patient cardiaque et diabétique (1 an)





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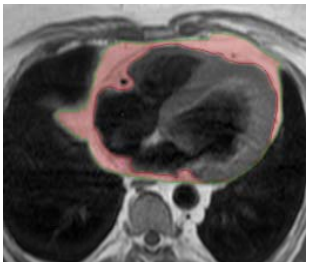

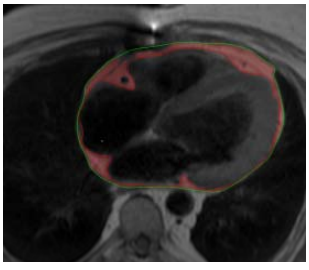

L'obésité et la santé : Au delà du poids, portons attention…

- à la graisse abdominale
- au coeur/foie "gras"
- à l'infiltration graisseuse

L'individu « fat and fit » a moins de graisse viscérale/ectopique pour un IMC donné.

Comment prenons nous en charge le patient avec le diabète de type 2 au Canada?

- **Age:** 63 years
- **BMI:**
  - **Men=**30.3 kg/m^2
  - **Women=**31.4 Kg/m^2
- **HbA1c:** 6.9%
- **Blood pressure:** 130/76 mmHg
- **LDL-cholesterol:** 1.9 mmol/L
- **Dyslipidemia:** 55.4%
- **Hypertension:** 68.2%
- **Sedentary lifestyle:** 56.5% (reported!!!)
- **Current or previous smoker:** 32.7%

Adapted from Teoh H et al.
Diabetes Obes Metab 2013, Epub ahead of print

Le patient canadien avec le diabète de type 2

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D'autres cibles?

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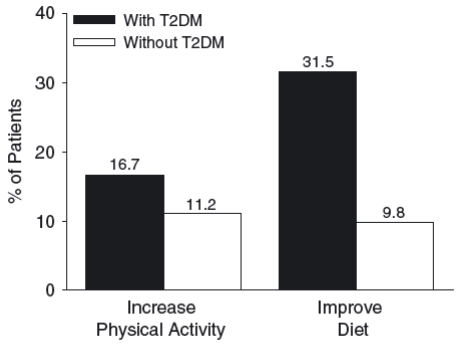
Proportion des patients suivis en première ligne recevant des recommandations nutritionnelles et sur l'activité physique



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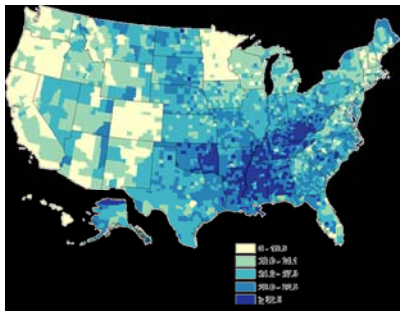
Aligner nos messages cliniques et de santé publique sur la science

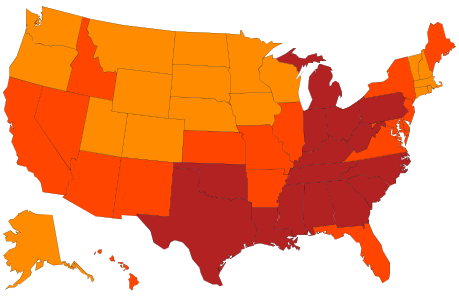
- **Risques de l'obésité:**
  (Bien plus que l'IMC et la perte de poids)
- **Mesurer et cibler des comportements: (qualité nutritionnelle, sédentarité, activité physique/exercice)**
- **Mesurer et cibler le tour de taille et la condition cardiorespiratoire**
- **Peu de ressources/moyens pour le faire**

Physical inactivity



Obesity

Diabetes



Obesity and type 2 diabetes: We should not forget inactivity…

Source: CDC website

De nouvelles cibles dans la prévention et la prise en charge des maladies chroniques sociétales

Évaluation et prise en charge du risque cardiométabolique en clinique

- Obésité abdominale
- Condition cardiorespiratoire
- Qualité nutritionnelle
- Activité physique

Prescrire l'activité physique…

…oui bien sûr…mais faciliter la vie au patient!!!

(et attention aux effets secondaires… procure du bonheur!)