

L'activité physique



Dre Marie-Kristelle Ross
Cardiologue

GMF Lévis-Metro
Novembre 2016

Objectifs

- Introduction à la réadaptation cardiaque
- Connaître les données probantes en lien avec l'activité physique
- Connaître les recommandations et les contre-indications à la réadaptation cardiaque chez les patients avec pathologies cardiaques

Quelques définitions

- **Activité physique**
 - Tout mouvement produit par les muscles squelettiques, qui responsable d'une augmentation de la dépense énergétique (inclut AVD, loisirs et sport)
- **Exercice**
 - Activité physique qui est planifiée, structurée et réalisée avec l'intention d'améliorer la condition physique
- **Sédentarité**
 - Comportement qui implique une dépense énergétique inférieure à 1.5 METS

It's not that diabetes, heart disease and obesity runs in your family. It's that no one runs in your family.



som^{ee}cards
user oard

Saviez-vous que...

- Les lignes directrices canadiennes recommandent un minimum de **150 minutes** d'activité physique par semaine.
- Seulement **15%** de la population suit ces recommandations.

- Les **canadiens** passent en moyenne plus de **10 heures** par jour en position assise.



- Les données de l'Organisation Mondiale de la Santé montrent que la **sédentarité** est la **4^{ième}** **cause de décès** dans le monde.
- À elle seule, elle serait responsable de **3.2 millions** de décès par année.



- Selon l'OMS, l'**inactivité physique** est la cause principale de :
 - 23% des maladies cardiaques
 - 17% des cancers du colon
 - 15% des cas de diabète
 - 12% des AVC
 - 11% des cancers du sein

WHO, 2002.

- Seulement au **Canada**, l'inactivité physique à entraîné des couts de **6.8 milliards** en 2009.



Bénéfices de l'exercice

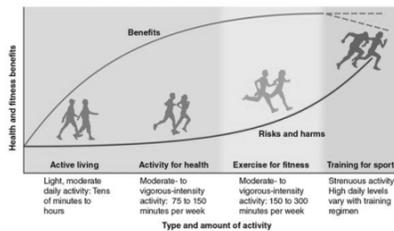
- Diminue la mortalité
- Maladie cardio-vasculaire
- Diabète
- Cancer
- Ostéoporose
- Arrêt tabagique
- Fonction cognitive
- Humeur
- Etc..



Physical Activity Recommendations and Decreased Risk of Mortality

Michael F. Leitzmann, MD, DrPH; Yikyung Park, ScD; Aaron Blair, PhD; Rachel Ballard-Barbash, MD; Traci Mouw, MPH; Albert R. Hollenbeck, PhD; Arthur Schatzkin, MD, DrPH
ARCH INTERN MED/VOL 167 (NO. 22), DEC 10/24, 2007

- 250 000 hommes et femmes
- Agés entre 50 et 70 ans
- **Activité physique modérée** (au moins 30 minutes la plupart des jours) est associée à une **diminution de la mortalité de 27%**
- **Activité physique intense** (au moins 20 minutes 3X par semaine) est associée à une **diminution de la mortalité de 32%**



Maladie coronarienne

Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study

Salim Yusuf, Steven Hawken, Stephanie Ôunpuu, Tony Dans, Alvaro Avezum, Fernando Lanas, Matthew McQueen, Andrzej Budaj, Prem Pais, John Varigos, Liu Lisheng, on behalf of the INTERHEART Study Investigators*
Lancet 2004; 364: 987-92

1. Activit  physique (OR 0.86)
2. Consommation d'alcool (OR 0.91)
3. Dyslipid mie (ratio apolipoprot ines) (OR 3.25)
4. Tabagisme (OR 2.87)
5. Di te / alimentation (OR 2.67)
6. Facteurs psychologiques (OR 2.67)
7. Diab te (OR 2.37)
8. Hypertension (OR 1.91)
9. Ratio taille/hanche (OR 1.12)

men and women, old and young, and in all regions of the world. Collectively, these nine risk factors accounted for 90% of the PAR in men and 94% in women.

Cancer

- Exercice semble conf rer une protection modeste contre les cancers suivants
 - Sein
 - Intestin
 - Prostate
 - Endom tre
 - Pancr as
- Une m ta-analyse 21  tudes montre une ↓ 27% du risque de n oplasie colique proximale¹

1. J Natl Cancer Inst 2012; 104:1548

Fonction cognitive

- Des études suggèrent que l'activité physique diminue le risque de démence et ralentit le déclin cognitif chez les patients âgés
- L'exercice est également associé à une meilleure acuité des fonctions cognitives chez les jeunes adultes¹

1. Mayo Clin Proc 2015; 90:450.

Sécurité de l'activité physique

- Les bénéfices surpassent (presque) toujours les risques
 - **Problèmes musculo-squelettiques** de loin les plus fréquents
 - Mort subite
 - Infarctus
 - Bronchospasme
 - Autres: rhabdomyolyse, désordres ioniques, coup de chaleur, etc.

Les complications surviennent surtout chez les gens qui ne sont pas habitués d'être actifs

Mort subite

- Le risque de mort subite à l'exercice est extrêmement faible
 - 1 décès par 1.5 millions de séances d'exercice₁
 - 1 décès par 36.5 millions d'heures d'exercice₂

- Généralement secondaire à
 - MCAS
 - Arythmie
 - Maladie cardiaque congénitale/héréditaire
 - Myocardite

1. NEJM 2000; 343:1355
2. JAMA 2006; 295:1399

Infarctus du myocarde

- L'activité physique (incluant les activités sexuelles) est associée à une augmentation temporaire du risque d'avoir un infarctus

- Le risque est beaucoup plus haut chez les gens qui ne sont pas habitués d'être actifs₁
 - Risque relatif 6.9 chez les « sédentaires »
 - Risque relatif 1.3 chez les « actifs »

1. NEJM 1993; 329:1684.

Bronchospasme

- L'activité physique entraîne une augmentation de la bronchoconstriction chez la majorité des asthmatiques₁

- Si on améliore la capacité physique, on diminue la ventilation.minute requise pour un niveau d'exercice
 - Ce qui diminue le stimulus pour la bronchoconstriction

1. Curr Allergy Asthma Rep 2009; 9-433.

Absolute and relative contraindications to exercise treadmill testing

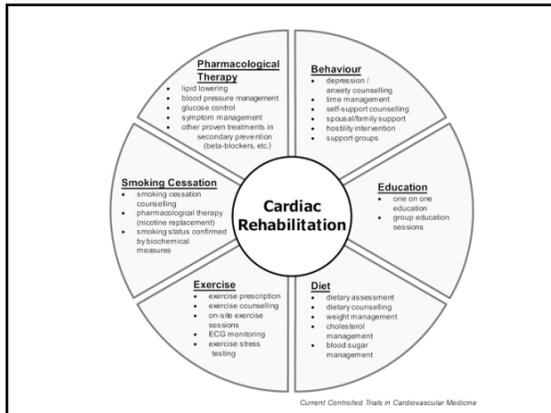
Absolute
Acute myocardial infarction (within two days)
Unstable angina
Uncontrolled cardiac arrhythmias causing symptoms or hemodynamic compromise
Symptomatic severe aortic stenosis
Uncontrolled symptomatic heart failure
Acute pulmonary embolus or pulmonary infarction
Acute myocarditis or pericarditis
Active endocarditis
Acute aortic dissection
Acute noncardiac disorder that may affect exercise performance or be aggravated by exercise (eg, infection, renal failure, thyrotoxicosis)
Inability to obtain consent

Relative*
Left main coronary stenosis or its equivalent
Moderate stenotic valvular heart disease
Electrolyte abnormalities
Severe hypertension (systolic ≥ 200 mmHg and/or diastolic ≥ 110 mmHg)
Tachyarrhythmias or bradyarrhythmias, including atrial fibrillation with uncontrolled ventricular rate
Hypertrophic cardiomyopathy and other forms of outflow tract obstruction
Mental or physical impairment leading to inability to cooperate
High-degree atrioventricular block



Réadaptation cardiaque

- *“Ensemble des activités nécessaires pour influencer favorablement le processus évolutif de la maladie, ainsi que pour assurer aux patients la meilleure condition physique, mentale et sociale possible, afin qu’ils puissent, par leurs propres efforts, préserver une place aussi normale que possible dans la communauté.”*



TRANSACTIONS. 59

VI. *Some Account of a Disorder of the Breast.* By WILLIAM HEBERDEN, M.D. F.R.S.

Read at the COLLEGE, JULY 21, 1768.

THERE is a disorder of the breast, marked with strong and peculiar symptoms, considerable for the kind of danger belonging to it, and not extremely rare, of which I do not recollect any mention among medical authors. The feat of it, and fenfe of frangling and anxiety with which it is attended, may make it not improperly be called Angina pectoris.

Those, who are afflicted with it, are seized, while they are walking, and more particularly when they walk soon after eating, with a painful and most disagreeable fenfation in the breast, which seems as if it would

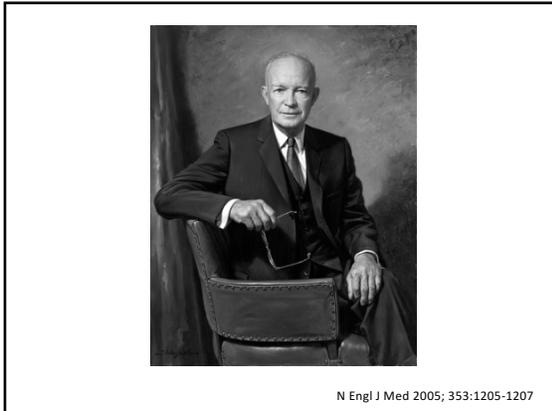
1772
30 min/jour d'exercice: une première cure pour l'angine?

"I knew of one who set himself the task of sawing wood for half an hour every day, and was nearly cured"



- En 1930, les patients ayant subi un infarctus étaient maintenus au **repos au lit strict** pendant une période de 6 semaines
- La permission d'utiliser la **chaise** a été introduite dans les années 1940¹.

1. Trans Assoc Am Physicians 1951;64:316-27







ORIGINAL ARTICLE

Rehabilitation after myocardial infarction trial (RAMIT): multi-centre randomised controlled trial of comprehensive cardiac rehabilitation in patients following acute myocardial infarction

Robert R West,¹ Dee A Jones,² Andrew H Henderson³ *Heart* 2012;**98**:637–644.

Results There were no significant differences between patients referred to rehabilitation and controls in mortality at 2 years (RR 0.98, 95% CI 0.74 to 1.30) or after 7–9 years (0.99, 95% CI 0.85 to 1.15), cardiac events, seven of eight domains of the health-related quality of life scale (Short Form 36, SF36) or the psychological general well-being scale. Rehabilitation patients reported slightly less physical activity. No differences between groups were reported in perceived overall quality of cardiac aftercare. Data from the 'elective' hospitals comparison concurred with these findings.

JAMA Cardiology | Original Investigation

Association Between Cardiac Rehabilitation Participation and Health Status Outcomes After Acute Myocardial Infarction

Faraz Kureishi, MD, MSc; Kevin F. Kennedy, MS; Philip G. Jones, MS; Randal J. Thomas, MD, MS; Suzanne V. Arnold, MD, MHA; Praneet Sharma, MD; Timothy Fendler, MD; Donna M. Buchanan, PhD; Mohammed Qintar, MD; P. Michael Ho, MD, PhD; Brahmajee K. Nallamothu, MD, MPH; Neil B. Oldridge, PhD; John A. Spertus, MD, MPH

Figure 4. Survival During the 7 Years After Acute Myocardial Infarction

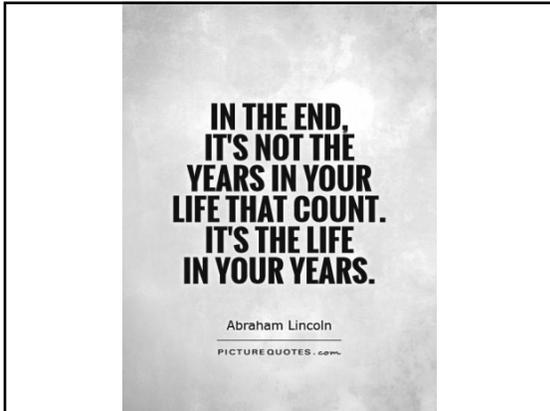
No. at risk	
CR	2012 1994 1950 1596 1289 926 648 441
No CR	2854 2822 2679 2137 1547 1070 782 478

Propensity-matched patients who participated in cardiac rehabilitation (CR) and those who did not participate in CR (hazard ratio, 0.59; 95% CI, 0.46–0.76).

Sécurité?

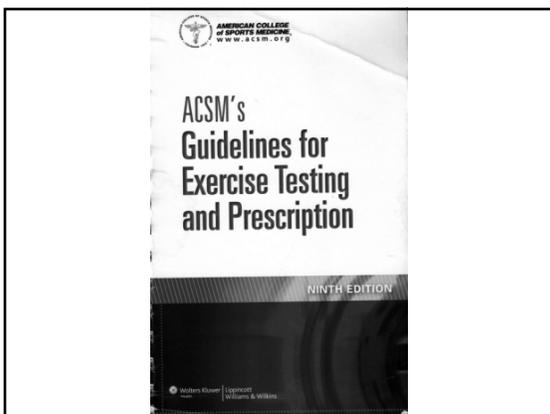
	Incidence d'événements graves lors d'un programme de réadaptation cardiaque
Haskell 1978	1 événement non fatal par 34 673 hres 1 événement fatal par 116 402 hres
Franklin et al., 1998	1 complication majeure par 81 670 heure-pt 1 arrêt cardiaque par 116 906 heure-pt 1 infarctus du myocarde par 219, 970 heure-pt 1 événement fatal par 752 365 heure-pt

From Franklin and Gordon (2005 pp 246 – 248)



Indications de la réadaptation cardiaque

- Théoriquement, la grande majorité des patients ayant une pathologie cardiaque ou vasculaire pourraient en bénéficier
- Dans un contexte où les ressources sont (malheureusement) limitées, on doit sélectionner les patients selon les données les plus probantes...



BOX 9.2 Indications and Contraindications for Inpatient and Outpatient Cardiac Rehabilitation

INDICATIONS

- Medically stable post-myocardial infarction (MI)
- Stable angina
- Coronary artery bypass graft (CABG) surgery
- Percutaneous transluminal coronary angioplasty (PTCA)
- Stable heart failure caused by either systolic or diastolic dysfunction (cardiomyopathy)
- Heart transplantation
- Valvular heart surgery
- Peripheral arterial disease (PAD)
- At risk for coronary artery disease (CAD) with diagnoses of diabetes mellitus, dyslipidemia, hypertension, or obesity
- Other patients who may benefit from structured exercise and/or patient education based on physician referral and consensus of the rehabilitation team

CONTRAINDICATIONS

- Unstable angina
- Uncontrolled hypertension — that is, resting systolic blood pressure (SBP) >180 mm Hg and/or resting diastolic BP (DBP) >110 mm Hg
- Orthostatic BP drop of >20 mm Hg with symptoms
- Significant aortic stenosis (aortic valve area <1.0 cm²)
- Uncontrolled atrial or ventricular arrhythmias
- Uncontrolled sinus tachycardia (>120 beats · min⁻¹)
- Uncompensated heart failure
- Third-degree atrioventricular (AV) block without pacemaker
- Active pericarditis or myocarditis
- Recent embolism
- Acute thrombophlebitis
- Acute systemic illness or fever
- Uncontrolled diabetes mellitus (see *Chapter 10*)
- Severe orthopedic conditions that would prohibit exercise
- Other metabolic conditions, such as acute thyroiditis, hypokalemia, hyperkalemia, or hypovolemia (until adequately treated)

Canadian Journal of Cardiology 39 (2014) 837–849

Society Guidelines

Canadian Cardiovascular Society Guidelines for the Diagnosis and Management of Stable Ischemic Heart Disease

IV. Provision of Appropriate Clinical Follow-up

RECOMMENDATION

1. We suggest that a resting ECG be acquired with a change in symptom status or in the setting of annual routine clinical follow-up (Conditional Recommendation, *Low-Quality Evidence*).
2. We suggest that patients with SIHD who have not previously participated be referred to a comprehensive cardiac rehabilitation program (Conditional Recommendation, *Moderate-Quality Evidence*).
3. We suggest that asymptomatic patients with SIHD, with the approval of their physician, should accumulate 150 minutes of moderate to vigorous physical activity per week, preferably in bouts of 10 minutes or more, with additional exercise providing additional benefits (Conditional Recommendation, *Moderate-Quality Evidence*).

CANADIAN CARDIOVASCULAR SOCIETY PERSPECTIVE

Canadian Cardiovascular Society Working Group: Providing a perspective on the 2007 focused update of the American College of Cardiology and American Heart Association 2004 guidelines for the management of ST elevation myocardial infarction

Robert C Welsh MD FRCP(C), Andrew Travers MD², Thao Huynh MD³, Warren J Cantor MD^{4,5}

Can J Cardiol Vol 25 No 1 January 2009

Aggressive lifestyle modification, risk factor management and cardiac rehabilitation should be promoted in all patients following STEMI. Formal smoking cessation programs should be encouraged in the hospital, and every tobacco user and family member should be advised to quit during every visit to a health care provider.

Horizontal lines for notes.

Canadian Journal of Cardiology 30 (2014) 249–263

Society Guidelines

The 2013 Canadian Cardiovascular Society Heart Failure Management Guidelines Update: Focus on Rehabilitation and Exercise and Surgical Coronary Revascularization

RECOMMENDATION

1. We recommend that all patients with stable New York Heart Association (NYHA) class I-III symptoms be considered for enrollment in a supervised tailored exercise training program, to improve exercise tolerance and quality of life (Strong Recommendation, Moderate-Quality Evidence).

Values and preferences. This recommendation places a high value on improvements in nonmedical outcomes and recognizes that not all patients will be able to participate in a structured exercise training program because of patient preferences or availability of resources.

2. We recommend that an assessment of clinical status by a clinician experienced in the management of HF patients be completed before considering an exercise training program (Strong Recommendation, Low-Quality Evidence).

Values and preferences. This recommendation places a high value on clinician's assessment of the clinical stability of a patient and their appropriateness to start exercise, recognizing that most patients will be eligible to participate.

Horizontal lines for notes.

RECOMMENDATION

1. We recommend that gradual mobilization and/or small muscle group strength/flexibility exercises be considered as soon as possible either alone or in combination for patients with NYHA class IV symptoms or recently decompensated HF. This should be considered only in

consultation with an experienced HF team (Strong Recommendation, Low-Quality Evidence).

Values and preferences. This recommendation places high value on initiating mobilization and therapy early (even if only limited exercises are prescribed) to prevent further decline of muscle function, improve function during day-to-day activities, and provide a baseline from which to add further exercise modalities.

Horizontal lines for notes.

AHA/ACC Guideline

2014 AHA/ACC Guideline for the Management of Patients With Non–ST-Elevation Acute Coronary Syndromes
 A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines

6.3.1. Cardiac Rehabilitation and Physical Activity: Recommendation

Class I

1. All eligible patients with NSTE-ACS should be referred to a comprehensive cardiovascular rehabilitation program either before hospital discharge or during the first outpatient visit.^{449–453} (Level of Evidence: B)

ACC/AHA Practice Guidelines

ACC/AHA 2005 Practice Guidelines for the Management of Patients With Peripheral Arterial Disease (Lower Extremity, Renal, Mesenteric, and Abdominal Aortic): Executive Summary

A Collaborative Report From the American Association for Vascular Surgery/Society for Vascular Surgery,⁶ Society for Cardiovascular Angiography and Interventions, Society for Vascular Medicine and Biology, Society of Interventional Radiology, and the ACC/AHA Task Force on Practice Guidelines (Writing Committee to Develop Guidelines for the Management of Patients With Peripheral Arterial Disease)

RECOMMENDATIONS

Class I

1. A program of supervised exercise training is recommended as an initial treatment modality for patients with intermittent claudication. (Level of Evidence: A)

2. Supervised exercise training should be performed for a minimum of 30 to 45 minutes, in sessions performed at least 3 times per week for a minimum of 12 weeks. (Level of Evidence: A)

Class IIb

1. The usefulness of unsupervised exercise programs is not well established as an effective initial treatment modality for patients with intermittent claudication. (Level of Evidence: B)

Malgré toutes ces recommandations...

Canadian Journal of Cardiology 27 (2011) 192-199

Society Position Statement
Systematizing Inpatient Referral to Cardiac Rehabilitation 2010: Canadian Association of Cardiac Rehabilitation and Canadian Cardiovascular Society Joint Position Paper
 Endorsed by the Cardiac Care Network of Ontario

Conclusions

Despite the proven benefits of CR,³ only an average of 34% of eligible patients are referred,⁵⁵ and 20% ultimately enroll.²¹ This trend runs counter to evidence-based clinical

Cardiac Rehabilitation Wait Times
EFFECT ON ENROLLMENT

Kelly L. Russell, MSc; Tanya M. Holloway, MSc; Margaret Brum, BAsC; Veola Caruso, RN; Caroline Chessex, MD; Sherry L. Grace, PhD

www.jcrjournal.com

RESULTS: Median wait time from referral receipt to CR intake was 42.0 days. Wait time had a negative effect on CR enrollment, such that **for every 1-day increment in wait time, patients were 1% less likely to enroll.**

Health Services and Outcomes Research

An Early Appointment to Outpatient Cardiac Rehabilitation at Hospital Discharge Improves Attendance at Orientation
A Randomized, Single-Blind, Controlled Trial

Quinn R. Pack, MD; Mouhamad Mansour, MD; Joaquim S. Barboza, MD; Brooks A. Hibner, BS; Meredith G. Mahan, MS; Jonathan K. Ehrman, PhD; Melissa A. Vanzant, BS; John R. Schairer, DO; Steven J. Keteyian, PhD

Background—Outpatient cardiac rehabilitation (CR) decreases mortality rates but is underutilized. Current median time from hospital discharge to enrollment is 35 days. We hypothesized that an appointment within 10 days would improve attendance at CR orientation.

Methods and Results—At hospital discharge, 148 patients with a nonsurgical qualifying diagnosis for CR were randomized to receive a CR orientation appointment either within 10 days (early) or at 35 days (standard). The primary end point was attendance at CR orientation. Secondary outcome measures were attendance at ≥1 exercise session, the total number of exercise sessions attended, completion of CR, and change in exercise training workload while in CR. Average age was 60±12 years; 56% of participants were male and 49% were black, with balanced baseline characteristics between groups. Median time (95% confidence interval) to orientation was 8.5 (7–13) versus 42 (35 to NA [not applicable]) days for the early and standard appointment groups, respectively ($P<0.001$). Attendance rates at the orientation session were 77% (57/74) versus 59% (44/74) in the early and standard appointment groups, respectively, which demonstrates a significant 18% absolute and 56% relative improvement (relative risk, 1.56; 95% confidence interval, 1.03–2.37; $P=0.022$). The number needed to treat was 5.7. There was no difference ($P>0.05$) in any of the secondary outcome measures, but statistical power for these end points was low. **Safety analysis demonstrated no difference between groups in CR-related adverse events.**

Conclusions—Early appointments for CR significantly improve attendance at orientation. This simple technique could potentially increase initial CR participation nationwide.

Clinical Trial Registration—URL: <http://www.clinicaltrials.gov>. Unique identifier: NCT01596036. (*Circulation*. 2013;127:349–355.)

Haykowsky et al. *Trials* 2011, 12:92
<http://www.trialsjournal.com/content/12/1/92>



RESEARCH Open Access

A Meta-analysis of the effects of Exercise Training on Left Ventricular Remodeling Following Myocardial Infarction: Start early and go longer for greatest exercise benefits on remodeling

Mark Haykowsky^{1*}, Jessica Scott², Ben Esch³, Don Schopflocher³, Jonathan Myers⁴, Ian Paterson⁵, Darren Warburton⁶, Lee Jones⁶ and Alexander M Clark⁶

Results: Greater reductions in ESV and EDV (as indicated by effect size decreases) occurred with earlier initiation of exercise training and with longer training durations (ESV: $Q = 23.89$, $df = 2$, $p < 0.05$, $R^2 = 0.79$; EDV: $Q = 27.42$, $df = 2$, $p < 0.01$, $R^2 = 0.83$). Differences remained following sensitivity analysis. **Each week that exercise was delayed required an additional month of training to achieve the same level of benefit on LV remodeling.**

