



BOUGER  
AVEC LE RÉSEAU



# Sport et activité physique adaptée

Pierre DECAVEL

Muntzenheim, le samedi 05 octobre 2024



UNIVERSITÉ DE FRIBOURG  
UNIVERSITÄT FREIBURG

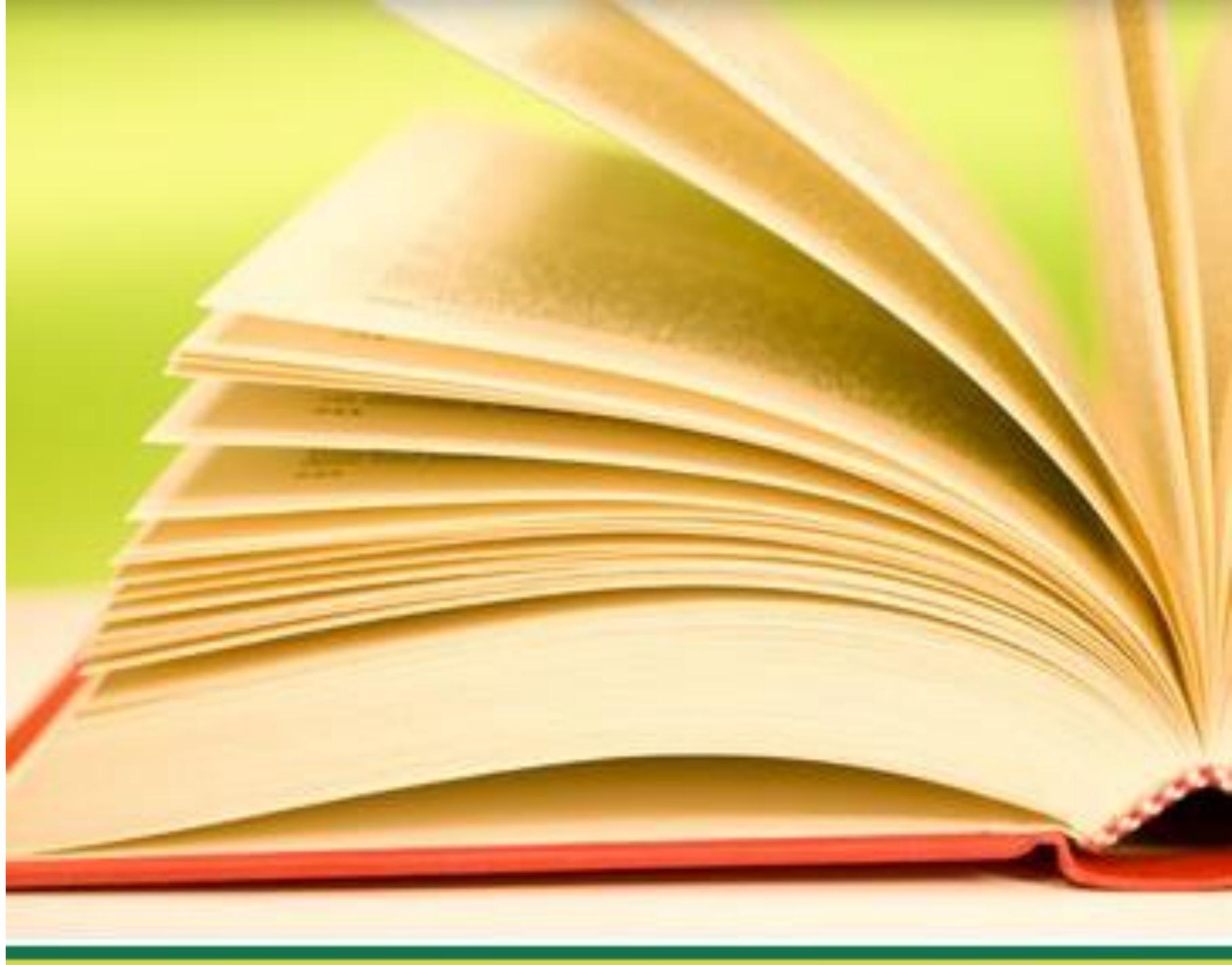




08/10/2024

καλὸς κἀγαθός

Position du  
probleme: un  
peu d'histoire ...



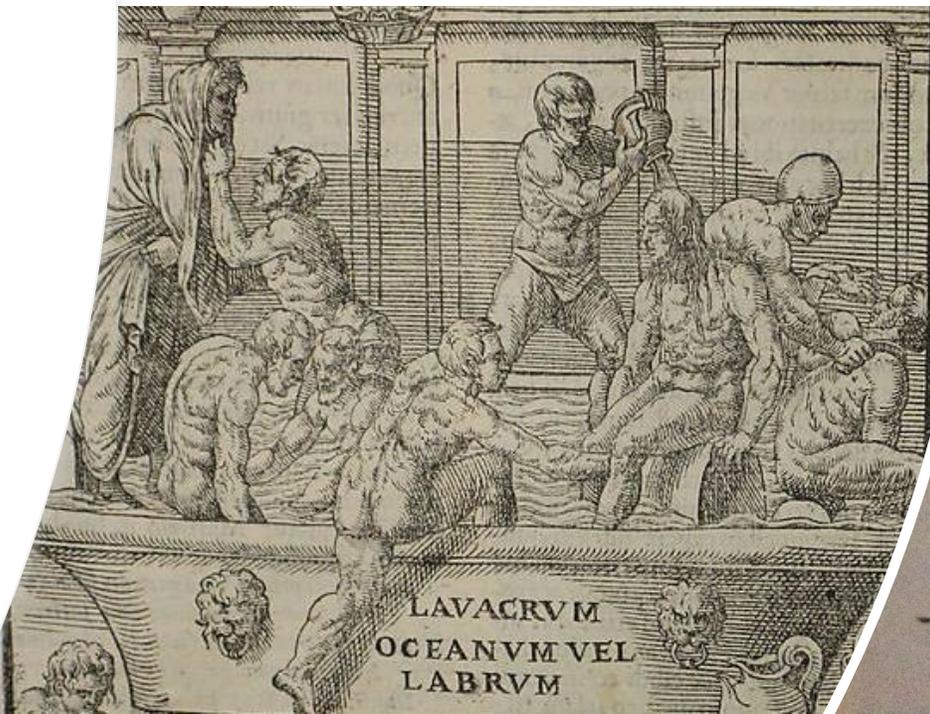


La "Grèce" antique  
*Mens sana in copore sano*

La Renaissance



*Hieronymus Mercurialis*  
1530-1606



LAVACRUM  
OCEANVM VEL  
LABRVM

HIERONYMI  
MERCVRIALIS  
DE ARTE GYMNASICA  
Libri Sex,

QVIBVS EXERCITATIONVM OMNIVM  
Vetustarum genera, loca, modi, facultates, & quidquid  
denique ad corporis humani exercitationes  
pertinet, diligenter explicatur.

*Quarta editione correctiores, & auctiores facti.*

non modo medicis, verum etiam omnibus antiquarum rerum  
cognoscendarum, & valetudinis conseruandae  
studiofis admodum vtile.

AD MAXIMILIANVM II.  
IMPERATOREM.



VENETIIS, APVD IVNTAS.  
M D C I.

10/8/2024

Nicolas  
Andry de  
Boisregard  
1658-1742

698  
L'ORTHOPE'DIE

OU

L'ART

DE PREVENIR ET DE CORRIGER

DANS LES ENFANS

LES DIFFORMITÉS DU CORPS.

LE TOUT PAR DES MOYENS

à la portée des Peres & des Meres, & de toutes  
les Personnes qui ont des Enfans à élever.

PAR M. ANDRY, CONSEILLER  
du Roy, Lecteur & Professeur en Médecine au  
College Royal, Docteur-Regent, & ancien Doyen  
de la Faculté de Médecine de Paris, &c.

Avec Figures.

TOME SECONDE



638  
A BRUXELLES,  
chez GEORGE FRICK, Imprimeur de  
Sa Majesté. 1743.

Approbation & Privilège de Sa Maje

Voir  
même fiche  
p 91/4140

10/8/2024



Joseph  
Clément  
Tissot  
1747-1826

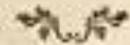
**L**A Gymnastique est cette partie de la Médecine , qui enseigne la maniere de conserver ou de rétablir la santé , par l'usage de l'exercice.

GYMNASTIQUE<sup>7</sup>  
MÉDICINALE  
ET CHIRURGICALE,  
OU  
ESSAI

Sur l'utilité du Mouvement, ou des  
différens Exercices du corps, & du  
repos dans la cure des Maladies ;

PAR M. TISSOT,

Docteur en Médecine, & Chirurgien-Major  
du quatrième Régiment des Chevaux-  
légers.



A PARIS,

chez BASTIEN, Libraire, rue du Petit-  
Châteaillon, près de la nouvelle Comédie Française,  
au quartier du Luxembourg.

M. DCC. LXXX.

Approbation & Privilège du Roi.

- 
- *Karel*
  - *1906-1991*
  - *Berta*
  - *1907-1991*
  - *Bobath*

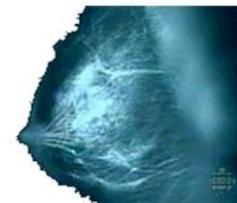




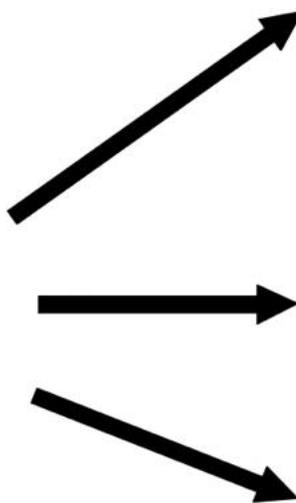
Au XXI<sup>ème</sup> siècle ?



# Morbidité et sédentarité



21 a 25% des cancers du colon et du sein.



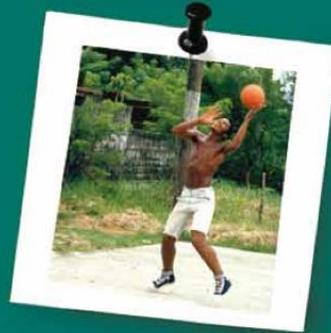
22% des diabètes.



30% de la charge de morbidité  
par cardiopathie ischémique.

# OMS

08/10/2024



## RECOMMANDATIONS MONDIALES SUR L'ACTIVITÉ PHYSIQUE POUR LA SANTÉ

# 5-17 ans

## 5-17 ans

Pour les enfants et jeunes gens de cette classe d'âge, l'activité physique englobe notamment le jeu, les sports, les déplacements, les activités récréatives, l'éducation physique ou l'exercice planifié, dans le contexte familial, scolaire ou communautaire. Pour améliorer l'endurance cardio-respiratoire, la forme musculaire et l'état osseux et réduire le risque de maladies non transmissibles, il est recommandé ce qui suit :

1. Les enfants et jeunes gens de 5 à 17 ans devraient accumuler au moins 60 minutes par jour d'activité physique d'intensité modérée à soutenue.
2. La pratique d'une activité physique pendant plus de 60 minutes par jour apportera un bénéfice supplémentaire pour la santé.
3. L'activité physique quotidienne devrait être essentiellement une activité d'endurance. Des activités d'intensité soutenue, notamment celles qui renforcent le système musculaire et l'état osseux, devraient être incorporées, au moins trois fois par semaine.

# 18-64 ans

## 18-64 ans

Pour les adultes de cette classe d'âge, l'activité physique englobe notamment les activités récréatives ou les loisirs, les déplacements (par exemple la marche ou le vélo), les activités professionnelles (par exemple le travail), les tâches ménagères, le jeu, les sports ou l'exercice planifié, dans le contexte quotidien, familial ou communautaire. Pour améliorer l'endurance cardio-respiratoire, la forme musculaire et l'état osseux et réduire le risque de maladies non transmissibles et de dépression, il est recommandé ce qui suit :

1. Les adultes âgés de 18 à 64 ans devraient pratiquer au moins, au cours de la semaine, 150 minutes d'activité d'endurance d'intensité modérée ou au moins 75 minutes d'activité d'endurance d'intensité soutenue, ou une combinaison équivalente d'activité d'intensité modérée et soutenue.
2. L'activité d'endurance devrait être pratiquée par périodes d'au moins 10 minutes.
1. Pour pouvoir en retirer des bénéfices supplémentaires sur le plan de la santé, les adultes de cette classe d'âge devraient augmenter la durée de leur activité d'endurance d'intensité modérée de façon à atteindre 300 minutes par semaine ou pratiquer 150 minutes par semaine d'activité d'intensité soutenue, ou une combinaison équivalente d'activité d'intensité modérée et soutenue.
2. Des exercices de renforcement musculaire faisant intervenir les principaux groupes musculaires devraient être pratiqués au moins deux jours par semaine.

# Plus de 65 ans

## 65 ans ou plus

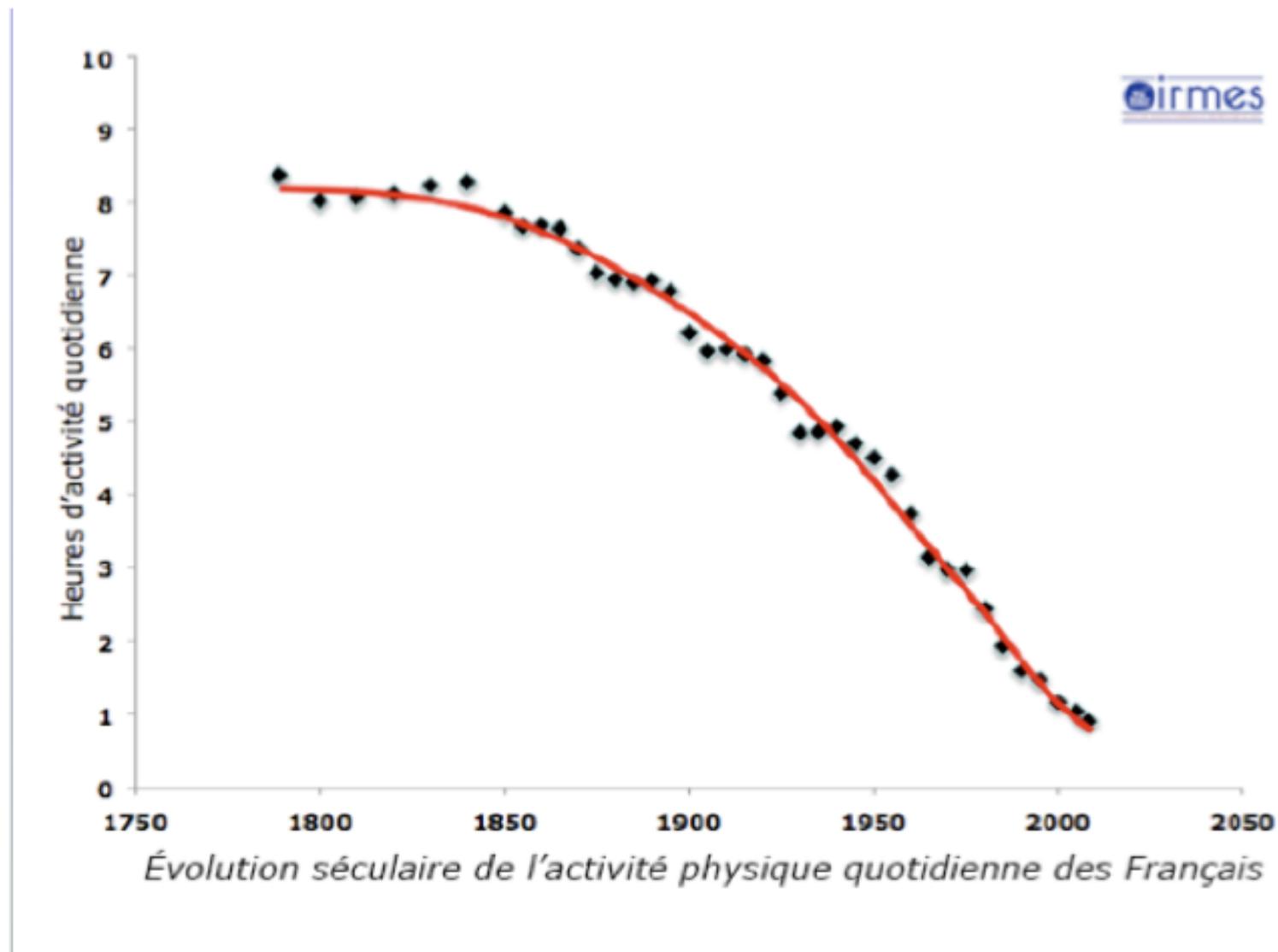
Pour les adultes de cette classe d'âge, l'activité physique englobe notamment les activités récréatives ou les loisirs, les déplacements (par exemple la marche ou le vélo), les activités professionnelles (si la personne travaille encore), les tâches ménagères, les activités ludiques, les sports ou l'exercice planifié, dans le contexte quotidien, familial ou communautaire.

Pour améliorer l'endurance cardio respiratoire, la forme musculaire et l'état osseux et fonctionnel et réduire le risque de maladies non transmissibles, de dépression et de détérioration de la fonction cognitive, il est recommandé ce qui suit :

1. Les personnes âgées de 65 ans ou plus devraient pratiquer au moins, au cours de la semaine, 150 minutes d'activité d'endurance d'intensité modérée ou au moins 75 minutes d'activité d'endurance d'intensité soutenue, ou une combinaison équivalente d'activité d'intensité modérée et soutenue.
2. L'activité d'endurance devrait être pratiquée par périodes d'au moins 10 minutes.
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2. Les adultes de cette classe d'âge dont la mobilité est réduite devraient pratiquer une activité physique visant à améliorer l'équilibre et à prévenir les chutes au moins trois jours par semaine.
3. Des exercices de renforcement musculaire faisant intervenir les principaux groupes musculaires devraient être pratiqués au moins deux jours par semaine.
4. Lorsque des personnes âgées ne peuvent pas pratiquer la quantité recommandée d'activité physique en raison de leur état de santé, elles devraient être aussi actives physiquement que leurs capacités et leur état le leur permettent.

# Réponse des français

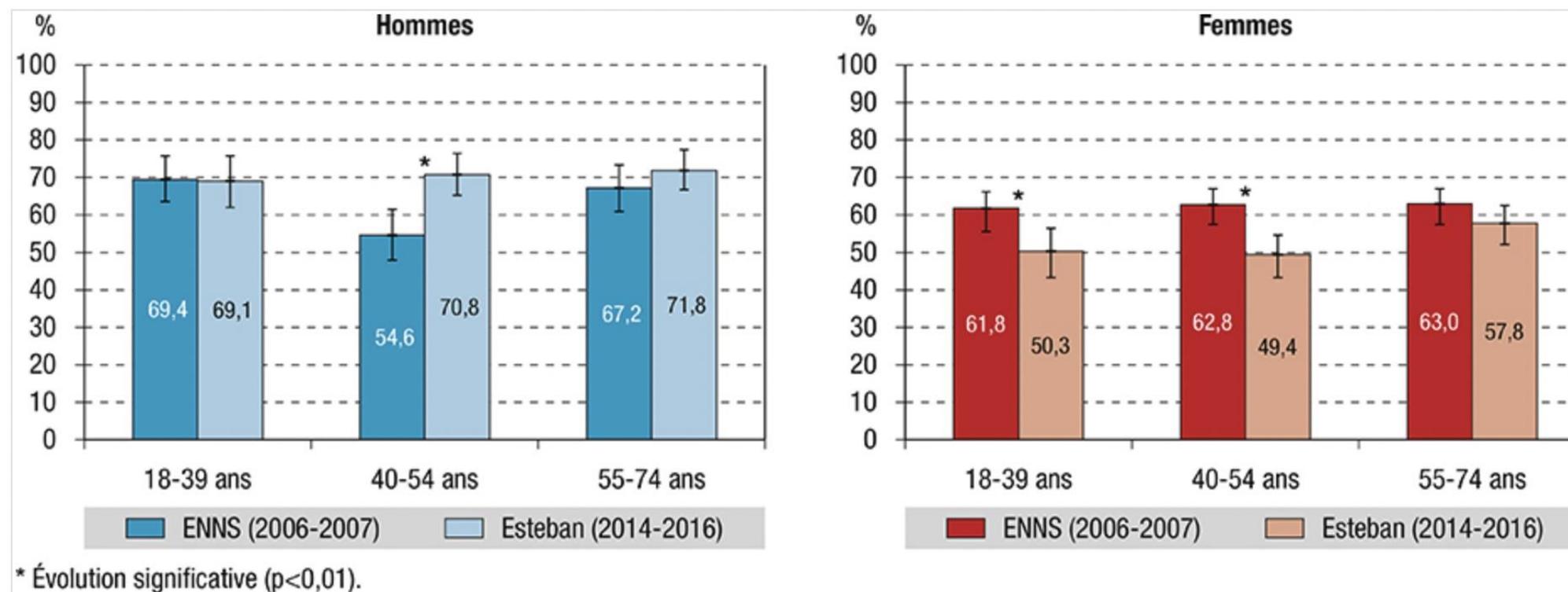
Rapport TOUSSAINT  
2008



Dans l'article : **Activité physique et sédentarité dans la population française. Situation en 2014-2016 et évolution depuis 2006-2007**

N° 15 - 9 juin 2020

Figure 1 : Évolution de la prévalence d'activité physique chez les hommes et les femmes de 18-74 ans, entre ENNS (2006-2007) et Esteban (2014-2016)



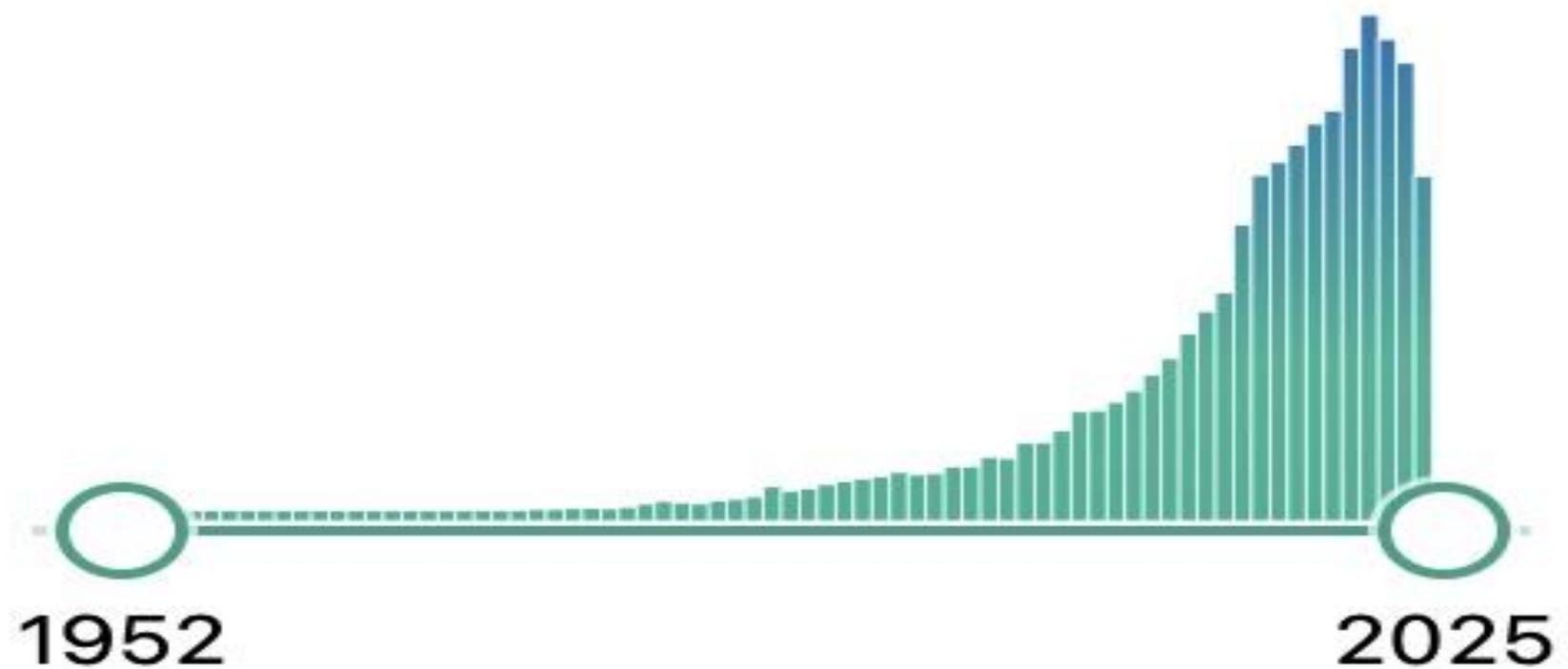


ALSACEP

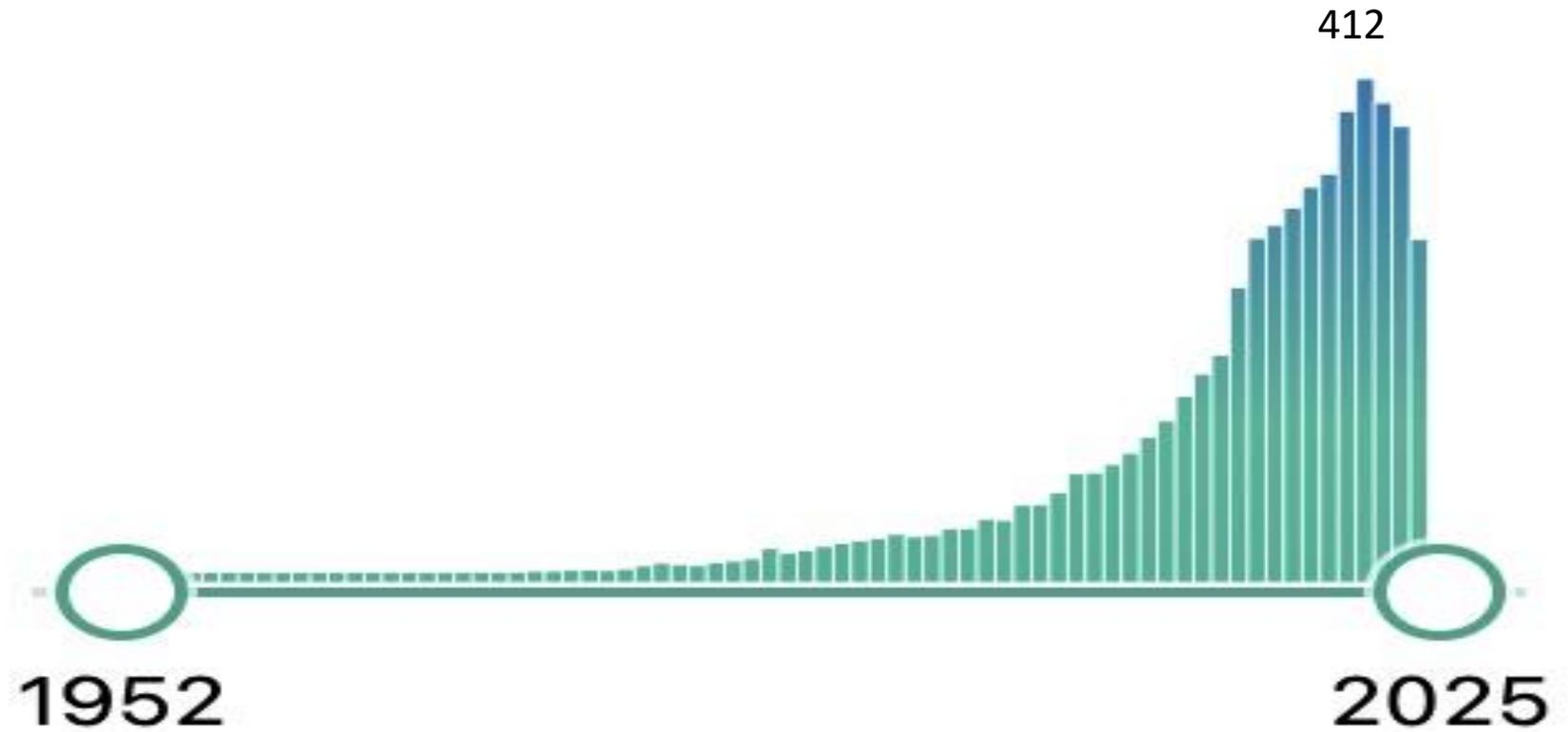


Et dans la SEP ?

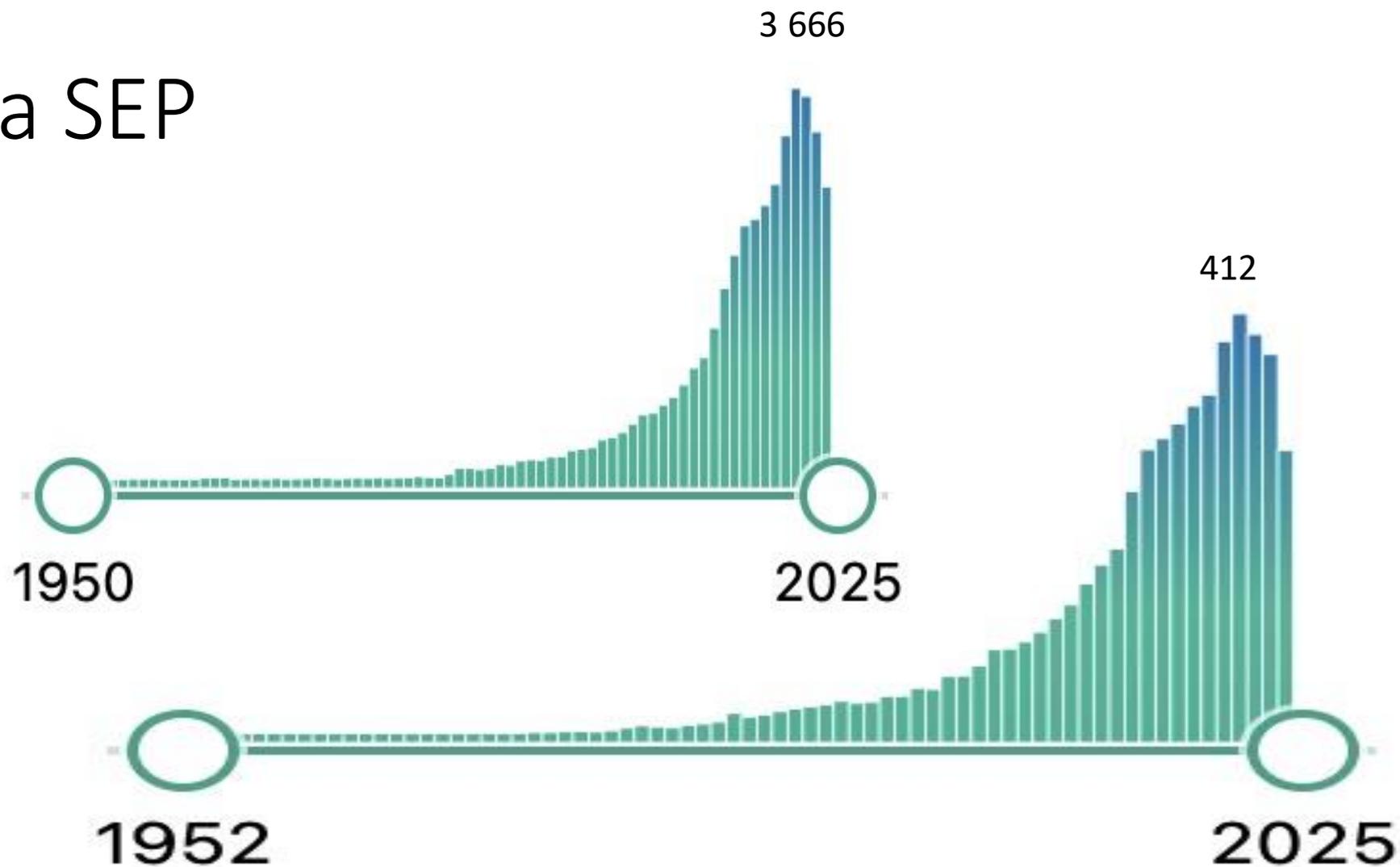
# Dans la SEP



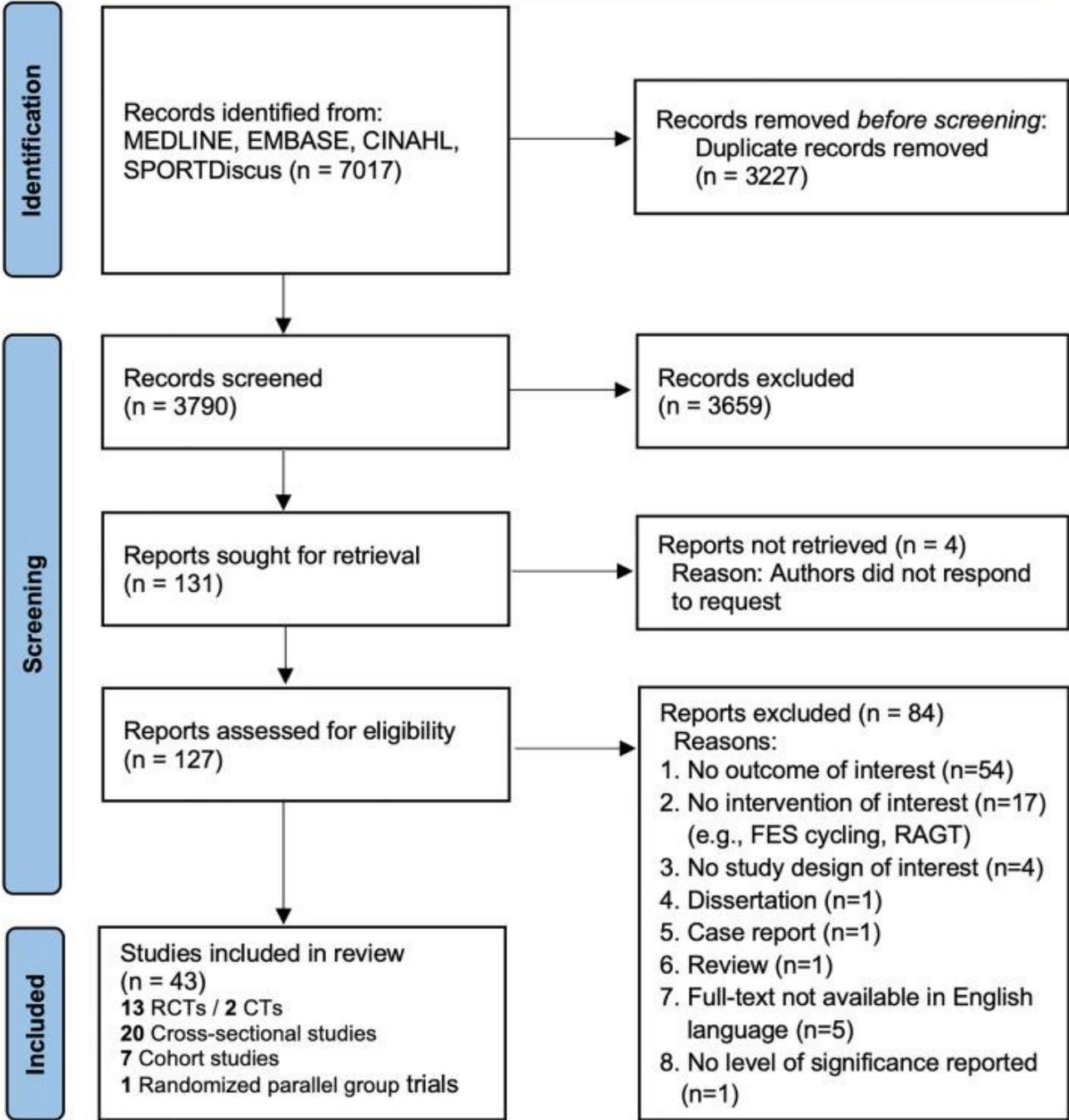
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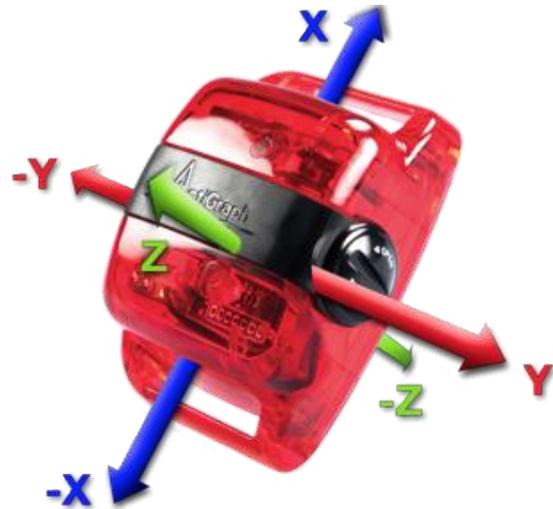


**Identification of studies via databases and registers**

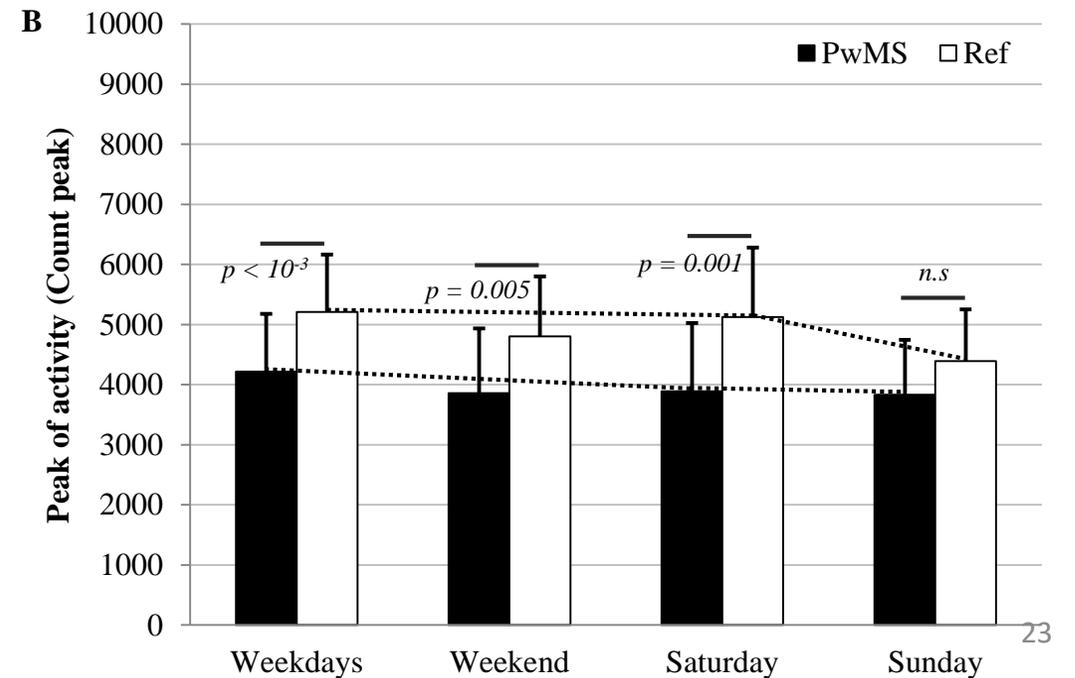
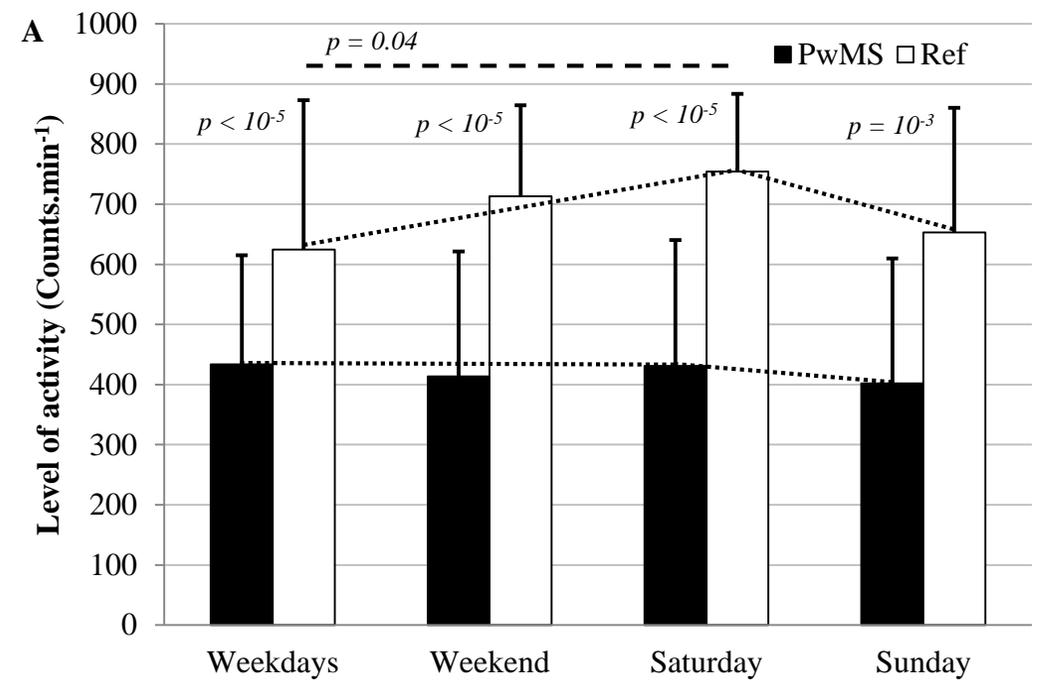


<sup>1</sup> Proschinger S J Neurol 2022

# Sclérose en plaques



**wGT3X+**  
(Serial numbers starting with NEO, CLE1, and CLE2)



# Sport et SEP

## The Practice of Sport in Multiple Sclerosis: Update

**Cecile Donze<sup>1</sup>; Caroline Massot, MD<sup>1</sup>; Patrick Hautecoeur<sup>2</sup>; Helene Cattoir-Vue<sup>1</sup>; and Marc-Alexandre Guyot<sup>1</sup>**

Yoga, aquagym, Tai-Chi, équithérapie<sup>1</sup>

Effets positifs sur :

- équilibre
- fatigue
- mobilité
- QdV

Le plus grand nombre de patients : 314 (Yoga)<sup>2</sup>

Mais méthodologie particulière :

3 groupes contrôles (effets + activité physique)

effet du Yoga sur la QdV

<sup>1</sup> Donze *Exercise in medicine* 2017

<sup>2</sup> Garret *et al. Mult Scler* 2013

# SEP : recommendations

[Arch Phys Med Rehabil.](#) 2013 Sep;94(9):1829-1836.e7. doi: 10.1016/j.apmr.2013.05.015. Epub 2013 Jun 11.

## Development of evidence-informed physical activity guidelines for adults with multiple sclerosis.

[Latimer-Cheung AE](#)<sup>1</sup>, [Martin Ginis KA](#), [Hicks AL](#), [Motl RW](#), [Pilutti LA](#), [Duggan M](#), [Wheeler G](#), [Persad R](#), [Smith KM](#).

<sup>1</sup> *Latimer-Cheung Arch Phys Med Rehabil 2013*

08/10/2024

Recommendations		
To achieve important fitness benefits adults (aged 18-65 years) with multiple sclerosis who have mild to moderate disability need <b>at least</b> :		
30 minutes of moderate intensity aerobic activity 2 times per week. AND Strength training exercises for major muscle groups 2 times per week.		
Meeting these guidelines may also reduce fatigue, improve mobility, and enhance elements of health related quality of life.		
Here is what is recommended:		
	Aerobic Activity	Strength Training Activity
How often?	Two times per week	Two times per week
	<ul style="list-style-type: none"> <li>Aerobic and strength training activities can be done on the same day</li> <li>Rest your muscles for at least one day between strength training sessions</li> </ul>	
How much?	Gradually increase your activity so that you are doing at least 30 minutes of aerobic activity during each workout session.	Repetitions are the number of times you lift and lower a weight.  Try to do 10-15 repetitions of each exercise. This counts as 1 set.  Gradually work up to doing 2 sets of 10-15 repetitions of each exercise.
How hard?	These activities should be performed at a moderate intensity.  Moderate-intensity physical activity is usually a 5 or 6 on a scale of 10, and causes your heart rate to go up.  As a general rule if you're doing moderate-intensity activity you can talk, but not sing a song, during the activity.	Pick a resistance (free weights, cable pulleys, bands, etc.) heavy enough that you can barely, but safely, finish 10-15 repetitions of the last set.  Be sure to rest for 1-2 minutes between each set and exercise.
How to?	Some options for activity include:  <b>Aerobic activities</b> <ul style="list-style-type: none"> <li>Upper Body Exercises: arm cycling</li> <li>Lower Body Exercises: walking, leg cycling</li> <li>Combined Upper and Lower body exercises: elliptical trainer</li> </ul>	<b>Strength training activities for the upper and lower body</b> <ul style="list-style-type: none"> <li>Weight machines</li> <li>Free weights</li> <li>Cable pulleys</li> </ul>
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Deux types d'activité : aérobie et en force

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Deux types d'activité : aérobie et en force

Deux fois par semaine

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Deux types d'activité : aérobie et en force

Deux fois par semaine

Aérobie : 30mn

Force : 10-15 répétitions deux fois

Aérobie : activité modérée

Force : activité en pic

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AND

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Meeting these guidelines may also reduce fatigue, improve mobility, and enhance elements of health related quality of life.

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How to?	<p>Some options for activity include:</p> <p>Aerobic activities</p> <ul style="list-style-type: none"> <li>Upper Body Exercises: arm cycling</li> <li>Lower Body Exercises: walking, leg cycling</li> <li>Combined Upper and Lower body exercises: elliptical trainer</li> </ul>	<p>Strength training activities for the upper and lower body</p> <ul style="list-style-type: none"> <li>Weight machines</li> <li>Free weights</li> <li>Cable pulleys</li> </ul>
	<p>Other types of exercise that may bring benefits</p> <ul style="list-style-type: none"> <li>Elastic resistance bands</li> <li>Aquatic exercise</li> <li>Calisthenics</li> </ul>	

# SEP : recommandations

[Arch Phys Med Rehabil](#). 2013 Sep;94(9):1829-1836.e7. doi: 10.1016/j.apmr.2013.05.015. Epub 2013 Jun 11.

## Development of evidence-informed physical activity guidelines for adults with multiple sclerosis.

[Latimer-Cheung AE](#)<sup>1</sup>, [Martin Ginis KA](#), [Hicks AL](#), [Motl RW](#), [Pilutti LA](#), [Duggan M](#), [Wheeler G](#), [Persad R](#), [Smith KM](#).



<sup>1</sup> Latimer-Cheung Arch Phys Med Rehabil 2013

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Recommendations		
To achieve important fitness benefits adults (aged 18-65 years) with multiple sclerosis who have mild to moderate disability need <b>at least</b> :		
30 minutes of moderate intensity aerobic activity 2 times per week. AND Strength training exercises for major muscle groups 2 times per week.		
Meeting these guidelines may also reduce fatigue, improve mobility, and enhance elements of health related quality of life.		
Here is what is recommended:		
	Aerobic Activity	Strength Training Activity
How often?	Two times per week	Two times per week
	<ul style="list-style-type: none"> <li>Aerobic and strength training activities can be done on the same day</li> <li>Rest your muscles for at least one day between strength training sessions</li> </ul>	
How much?	Gradually increase your activity so that you are doing at least 30 minutes of aerobic activity during each workout session.	Repetitions are the number of times you lift and lower a weight.  Try to do 10-15 repetitions of each exercise. This counts as 1 set.  Gradually work up to doing 2 sets of 10-15 repetitions of each exercise.
How hard?	These activities should be performed at a moderate intensity.  Moderate-intensity physical activity is usually a 5 or 6 on a scale of 10, and causes your heart rate to go up.  As a general rule if you're doing moderate-intensity activity you can talk, but not sing a song, during the activity.	Pick a resistance (free weights, cable pulleys, bands, etc.) heavy enough that you can barely, but safely, finish 10-15 repetitions of the last set.  Be sure to rest for 1-2 minutes between each set and exercise.
How to?	Some options for activity include:  <b>Aerobic activities</b> <ul style="list-style-type: none"> <li>Upper Body Exercises: arm cycling</li> <li>Lower Body Exercises: walking, leg cycling</li> <li>Combined Upper and Lower body exercises: elliptical trainer</li> </ul>	<b>Strength training activities for the upper and lower body</b> <ul style="list-style-type: none"> <li>Weight machines</li> <li>Free weights</li> <li>Cable pulleys</li> </ul>
	Other types of exercise that may bring benefits <ul style="list-style-type: none"> <li>Elastic resistance bands</li> <li>Aquatic exercise</li> <li>Calisthenics</li> </ul>	

# SEP : recommandations

Neuroepidemiology. 2006;27(1):28-32. Epub 2006 Jun 27.

## Limited impact of the summer heat wave in France (2003) on hospital admissions and relapses for multiple sclerosis.

Tataru N<sup>1</sup>, Vidal C, Decavel P, Berger E, Rumbach L.



08/10/2024

<sup>1</sup> *Latimer-Cheung Arch Phys Med Rehabil 2013*

<sup>2</sup> *Tataru et al. Neuroepidemiology 2006*

### Recommendations

To achieve important fitness benefits adults (aged 18-65 years) with multiple sclerosis who have mild to moderate disability need **at least**:

30 minutes of moderate intensity aerobic activity 2 times per week.

AND

Strength training exercises for major muscle groups 2 times per week.

Meeting these guidelines may also reduce fatigue, improve mobility, and enhance elements of health related quality of life.

Try to do 10-15 repetitions of each exercise. This counts as 1 set.

Gradually work up to doing 2 sets of 10-15 repetitions of each exercise.

**How hard?** These activities should be performed at a moderate intensity.

Moderate-intensity physical activity is usually a 5 or 6 on a scale of 10, and causes your heart rate to go up.

As a general rule if you're doing moderate-intensity activity you can talk, but not sing a song, during the activity.

Pick a resistance (free weights, cable pulleys, bands, etc.) heavy enough that you can barely, but safely, finish 10-15 repetitions of the last set.

Be sure to rest for 1-2 minutes between each set and exercise.

**How to?** Some options for activity include:

#### Aerobic activities

- Upper Body Exercises: arm cycling
- Lower Body Exercises: walking, leg cycling
- Combined Upper and Lower body exercises: elliptical trainer

#### Strength training activities for the upper and lower body

- Weight machines
- Free weights
- Cable pulleys

Other types of exercise that may bring benefits

- Elastic resistance bands
- Aquatic exercise
- Calisthenics



Le Pollux : 4091m. 8 août 2024



# Sport et SEP : impossible ?

*La lutte vers les sommets elle-même suffit à remplir un cœur d'homme.*

Albert Camus. Le mythe de Sisiphe. 1942

08/10/2024



08/10/2024

# Exercice dans la durée

*Clinical Study*

## **Impact of a 5-Day Expedition to Machu Picchu on Persons with Multiple Sclerosis**

**Marie Beatrice D'hooghe,<sup>1,2</sup> Peter Feys,<sup>3</sup> Sam Deltour,<sup>4</sup> Isabelle Van de Putte,<sup>5</sup>  
Jan De Meue,<sup>6</sup> Daphne Kos,<sup>7</sup> Bert O Eijnde,<sup>3</sup> and Paul Van Asch<sup>8</sup>**

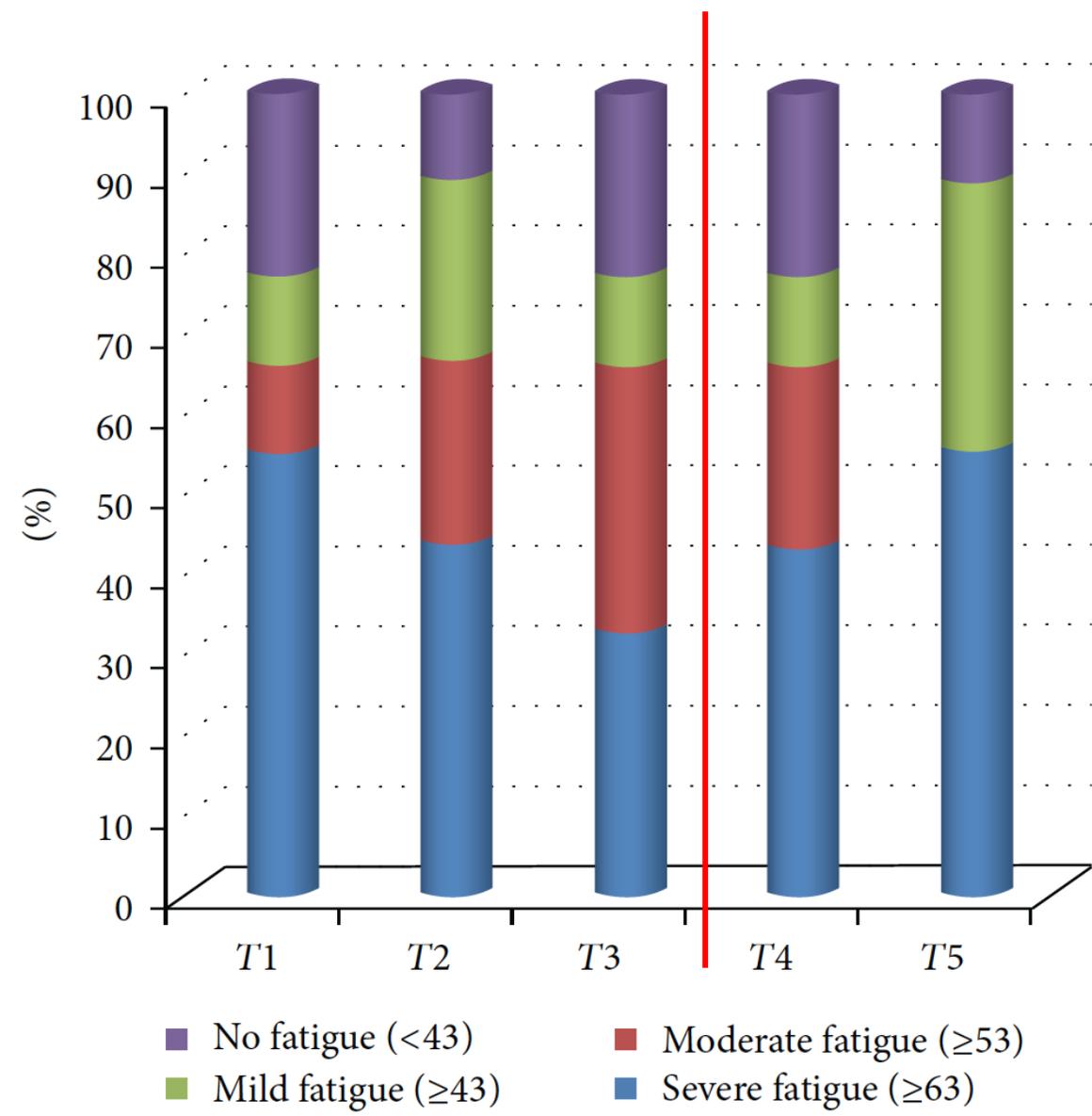
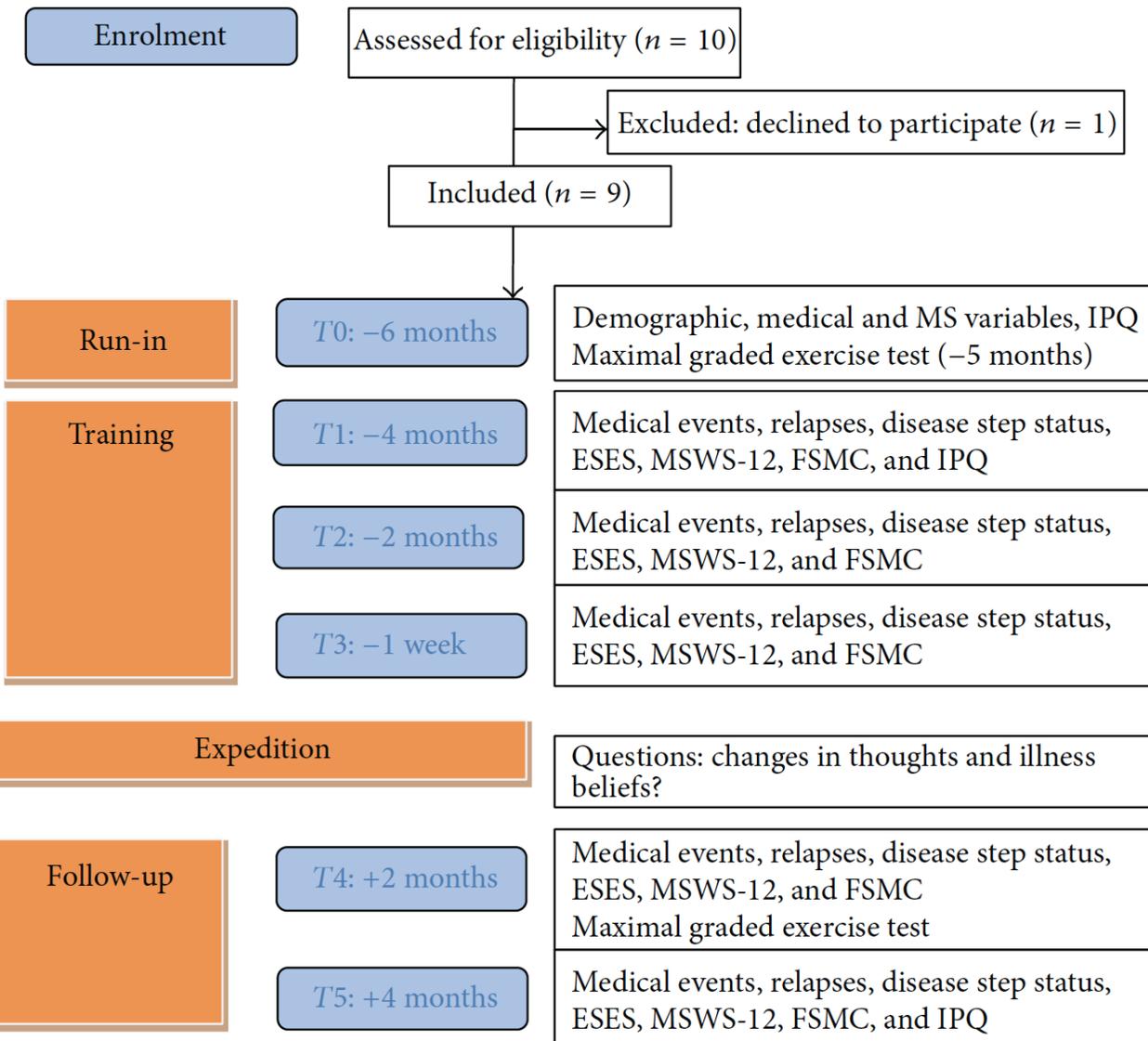
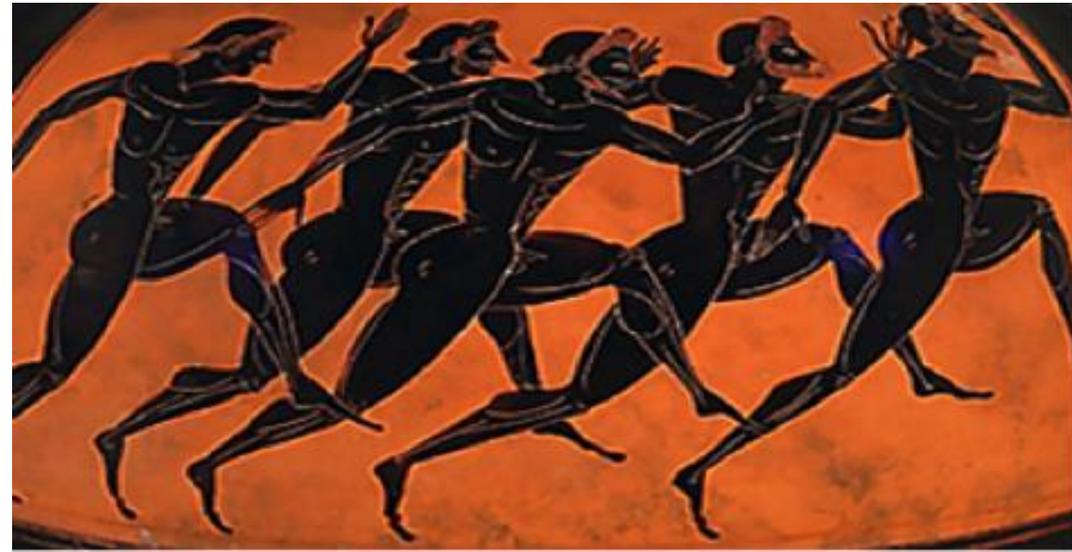


FIGURE 1: Enrolment, timeline, and assessments at different time points.

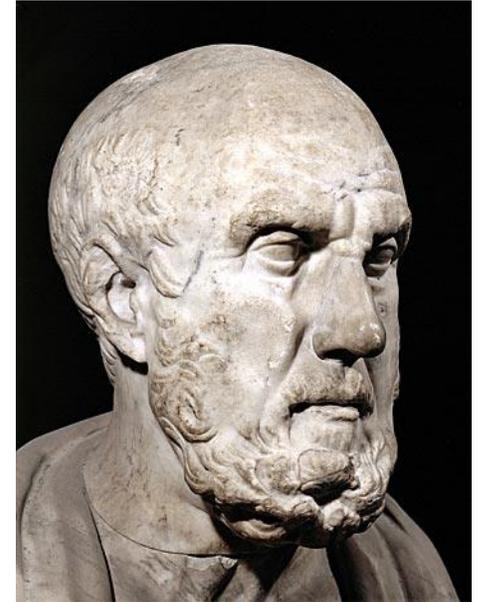
(a) Fatigue severity, FSMC sum

# Conclusion

καλὸς κἀγαθός



*«Aliments et exercices ont des vertus opposées, mais qui collaborent à la santé. Par nature, les exercices dépensent l'énergie disponible, les aliments et les boissons, eux compensent les pertes. Il importe, à ce qu'il semble, de discerner la vertu des exercices naturels ou violents; il importe à ce qu'il semble de discerner lesquels d'entre eux développent les chairs, lesquels les diminuent et non seulement cela, mais encore la proportion des exercices à l'égard de la quantité d'aliments, de la nature du patient, de son âge, des saisons de l'année, des changements de vents, de la situation des lieux où il vit, de la constitution de l'année. Il faut connaître le lever et le coucher des astres, pour savoir prendre garde aux changements et excès des aliments, des boissons, des vents de l'univers entier: c'est de tout cela que proviennent les maladies».*



Mais qu'il est difficile de prouver les évidences !!!!