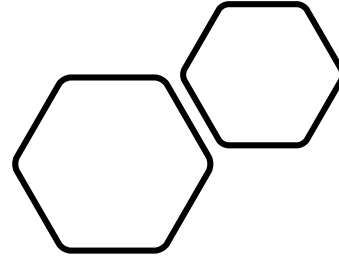


# Rannsóknir og Ávísun á hreyfingu



- Jón Steinar Jónsson
- Heilsugæslulæknir
- Yfirlæknir á Þróunarmiðstöð  
Íslenskrar heilsugæslu
- Lektor Læknadeild HÍ



Iceland

Vatnajökulsþjóðgarður

Raufarhöfn

Kópasker

Þórshöfn

76

Ólafsfjörður

Húsavík

Dalvík

85

Bakkafjörður

74

Sauðárkrúkur

82

Akureyri

Laugar

Reykjahlíð

85

Vopnafjörður

Blönduós

Varmahlíð

752

Ábær

1

85

Borgarfjörður

Eystrí

Húsavík

Egilsstaðir

Vallanes

Seyðisfjörður

Neskaupstaður

Reyðarfjörður

Fáskrúðsfjörður

Breiðdalsvík

Djúpvogur

1

Höfn

Höfn

Hof

Kálafell

Skaffafell

Kirkjubæjarklaustur

Grafarkirkja

35

Laugarvatn

Flúðir

36

Selfoss

35

32

26

Hella

261





© Mats Wibe Lund

Rannsóknir

# Praktisera læknisfræði

- Ábyrgð
- Skyldur
- Viðhorf
- Væntingar
- Álag
- Lífsfylling
- Nýta
- Nota
- Sóa

# Doctor's delay – klíník – rannsóknir -aðgengi


- Snúinn ökkli
- Höfuðverkur
- Brjóstverkur
- Mjóbaksverkur
- Kviðverkur
- Axlarverkur
- Hálshryggsverkur



# Snúinn ökkli

## The Ottawa Ankle Rules

A clinical decision rule to determine the need for diagnostic imaging for ankle and/or foot trauma

 Developed by Dr. Ian Stiell

 View Publications

An ankle X-Ray series is only required if there is any pain in the malleolar zone and...

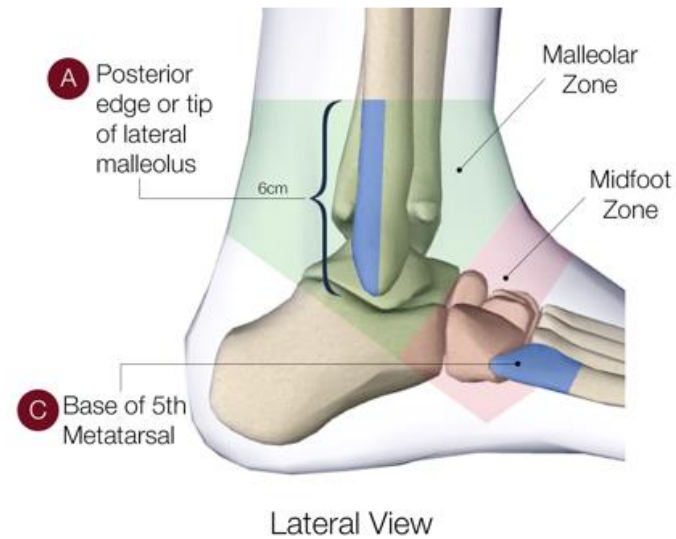
Bone tenderness at the posterior edge or tip of the lateral malleolus (A)

OR

Bone tenderness at the posterior edge or tip of the medial malleolus (B)

OR

An inability to bear weight both immediately and in the emergency department for four steps



# Mjóðbaksverkir - Myndgreining

## NICE júlí 2017

### Quality statement 2: Referrals for imaging

#### *Quality statement*

Young people and adults with low back pain with or without sciatica do not have imaging requested by a non-specialist service unless serious underlying pathology is suspected.

#### *Rationale*

Imaging does not often change the initial management and outcomes of someone with back pain. This is because the reported imaging findings are usually common and not necessarily related to the person's symptoms. Many of the imaging findings (for example, disc and joint degeneration) are frequently found in asymptomatic people. Requests for imaging by non-specialist clinicians, where there is no suspicion of serious underlying pathology, can cause unnecessary distress and lead to further referrals for findings that are not clinically relevant.

- Rauð flögg
- Breytir sjaldan byrjunarmeðferð og útkomu/árangri
- Frávik algeng og ekki endilega tengd einkennum
- Frávik algeng hjá bakfrískum
- Frávik geta valdið óþarfa áhyggjum og frekari óþarfa rannsóknum





-ALLT ÞAÐ, SEM SÉST Á MYNDUM HJÁ ÞEIM, SEM ERU MEÐ BAKVANDA, SÉST LÍKA HJÁ ÞEIM, SEM ALDREI HAFA FUNDIÐ TIL Í BAKI

- „IT'S QUITE ALRIGHT TO TAKE X-RAYS OF THE SPINE - IT CALMS THE PATIENT. - JUST DON'T LOOK AT THE PICTURES“(J.H.CYRIAX)

- MRI hjá einkennalausum
  - 20-40% með brjósklos
  - 80% með brjóskbungun

- ERFITT AÐ HORFA FRAM HJÁ NIÐURSTÖÐUM, ÞEGAR ÞÆR LIGGJA FYRIR

# Mjóbaksrannsóknir – Yfirlit BMJ 2014

- Getur verið ofnotað
  - Misleading findings
  - Lack of proved benefit
- MRI viðeigandi
  - Major neurologic deficits
  - Klínísk merki um brjós-klos eða stenosu sem ekki svarar meðferð
- Rauð flögg
  - Myndrannsókn

## KEY POINTS

Imaging of the lumbar spine for low risk patients can be overused given its low yield of useful findings, high yield of misleading findings, and lack of proved benefit for outcome. Radiography (with or without erythrocyte sedimentation rate) is often an appropriate initial test for suspected cancer, fracture, or inflammatory spondylopathy.

MRI is appropriate for patients with major neurologic deficits. It is also appropriate for those with a clinical picture of sciatica or stenosis who fail to improve with a therapeutic trial and are potential candidates for surgery or epidural steroids.

Patient histories of cancer, injection drug use, major trauma, or prolonged corticosteroid use are important "red flags" to prompt imaging; other individual red flags have weak likelihood ratios, and the full clinical picture should guide the ordering of lumbar images.

**BMJ,2001:** Hópur sjúklinga með mjóbaksverki. Slembival, hverjir voru myndaðir. Þeir,sem voru myndaðir voru ánægðari eftir á,en eftir nokkra mánuði höfðu þeir meiri verki og fannst heilsan verri en þeir, sem ekki voru myndaðir.

**Am.Journal of Neuroradiology,2008:** Hópur sjúklinga með bakverki.Allir myndaðir, en niðurstöður einungis sagðar helmingnum.Við eftirlit síðar reyndust þeir verr staddir hvað bata varðar.

**JAMA,2003:** Sjúklingahópur, sem röntgenmyndataka hafði verið pöntuð fyrir.Helmingur var í staðinn sendur í SÓ (slembival). Þeir,sem fóru í SÓ, voru tvöfalt líklegri til að fara í skurðaðgerð. Bataprósentan við eftirfylgni var sú sama.

**Spine,2005:** Hópur af fólki án bakverkjasögu fór í SÓ. SÓ er léleg að ferð til að finna út, hverjir muni fá bakverki og hverjir ekki

# Myndgreining af hryggsúlu

- Hver er spurningin?
- Færðu svarið?
- Breytir svarið meðferðinni?
- Hefur svarið meðferðargildi?
- Kostnaður?

# Axlarverkir

- Algengi axlarverkja 7-26%
- Þriðja algengasta stoðkerfisvandamálið (mjóbak og hálshryggur)
- MRI hjá 96 einkennalausum einstaklingum
  - 15% fullþykktarrifa í rotator cuff sin
  - 20% rifa í rotator cuff sin
  - 54% eldri en 60 ára höfðu rifu í rotator cuff



# 57 ára karl – axlarverkur í 3 mán

- 2 vikur í meðferð hjá sjúkráþjálfara
- Sjúkráþjálfari mælir með röntgenrannsókn
- Vægt minnkuð og sár abduction
- Útrot eðlileg
- Isometrískt í lagi
- Ekki palp eymsli
- Ac liður í lagi
- Röntgenrannsókn? Hvaða?

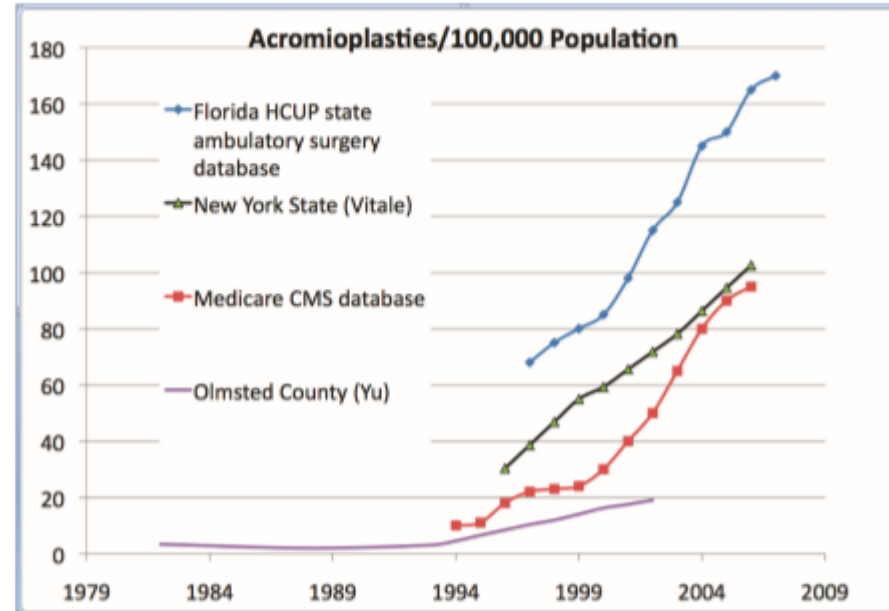


Fig. 1

Rates of acromioplasty per 100,000 individuals. Data are from the Florida Healthcare Utilization Project (HCUP) State Ambulatory Surgery Database (SASD), the recent paper by Vitale et al.<sup>3</sup> for the State of New York, the national Centers for Medicare and Medicaid Services (CMS) database, and a recent paper by Yu et al.<sup>2</sup> regarding Olmsted County, Minnesota. The Medicare data represent the rates of acromioplasty, including inpatient, outpatient, open, and arthroscopic procedures, among Medicare enrollees (individuals sixty-five years and older) from 1994 through 2006 obtained from the CMS. These rates are based on the 5% CMS sample from 1994 to 2001 and the 20% sample from 2002 to 2006. Essentially all of the increase has been in arthroscopic acromioplasty, while the rate of open acromioplasty has remained essentially unchanged. The Florida data show the rate of outpatient acromioplasty among Florida residents over the age of fifteen years from 1997 to 2003. The Florida HCUP SASD database is one of the few available that allows one to calculate population rates of outpatient procedures on the basis of CPT codes rather than ICD codes.

## Subacromial decompression versus diagnostic arthroscopy for shoulder impingement: randomised, placebo surgery controlled clinical trial

Mika Paavola,<sup>1</sup> Antti Malmivaara,<sup>2</sup> Simo Taimela,<sup>1,3</sup> Kari Kanto,<sup>4</sup> Jari Inkinen,<sup>5</sup> Juha Kalske,<sup>6</sup> Ilkka Sinisaari,<sup>7</sup> Vesa Savolainen,<sup>8</sup> Jonas Ranstam,<sup>9</sup> Teppo L N Järvinen<sup>1,3</sup> for the Finnish Shoulder Impingement Arthroscopy Controlled Trial (FIMPACT) Investigators

### WHAT IS ALREADY KNOWN ON THIS TOPIC

Arthroscopic subacromial decompression, the most commonly performed shoulder surgery, is carried out to treat patients with shoulder impingement syndrome

Three recent systematic reviews indicate that subacromial decompression is not superior to exercise therapy in patients with shoulder impingement syndrome

Without a placebo surgical comparator (proper blinding), the efficacy of arthroscopic subacromial decompression cannot be assessed

### WHAT THIS STUDY ADDS

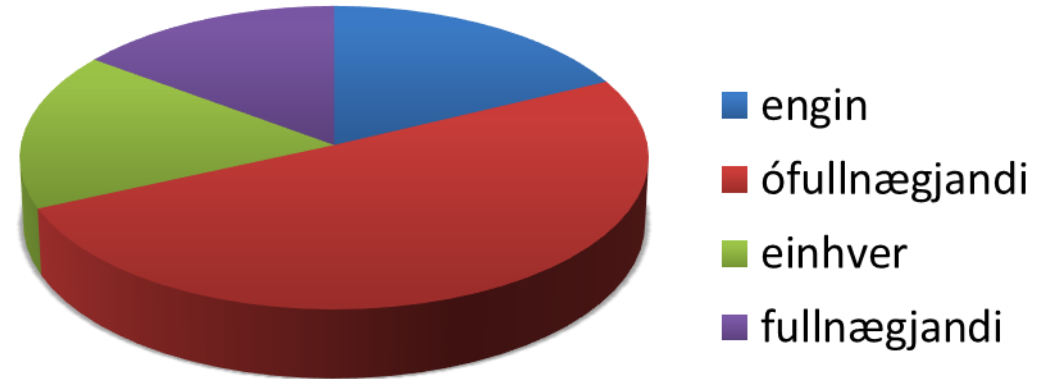
This FIMPACT trial and the recently published (highly similar) CSAW trial are the first two placebo surgery controlled trials on the efficacy of arthroscopic subacromial decompression

Both arthroscopic subacromial decompression and diagnostic arthroscopy (placebo surgery) resulted in significant improvements in pain and functional outcomes with no difference in the incidence of adverse events

However, the patients assigned to arthroscopic subacromial decompression had no superior improvement over those assigned to diagnostic arthroscopy

Ávísun á hreyfingu - Hreyfiseðlar

# HREYFINGARLEYSI OG ALMENN HREYFING



FARALDUR HREYFINGARLEYSIS

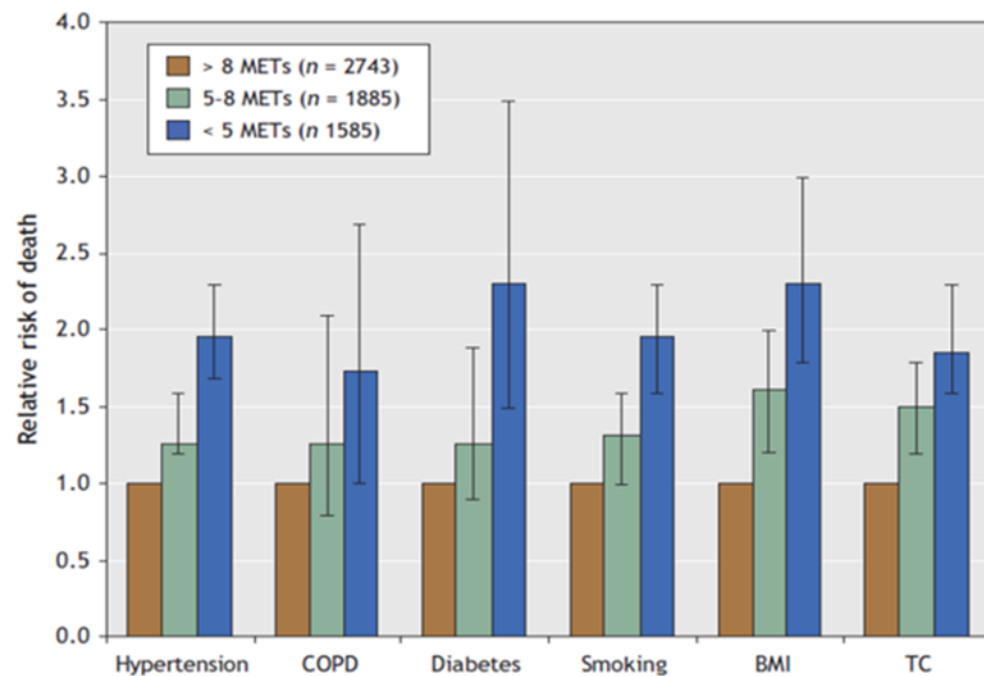
REGLUBUNDIN HREYFING Á VESTURLÖNDUM



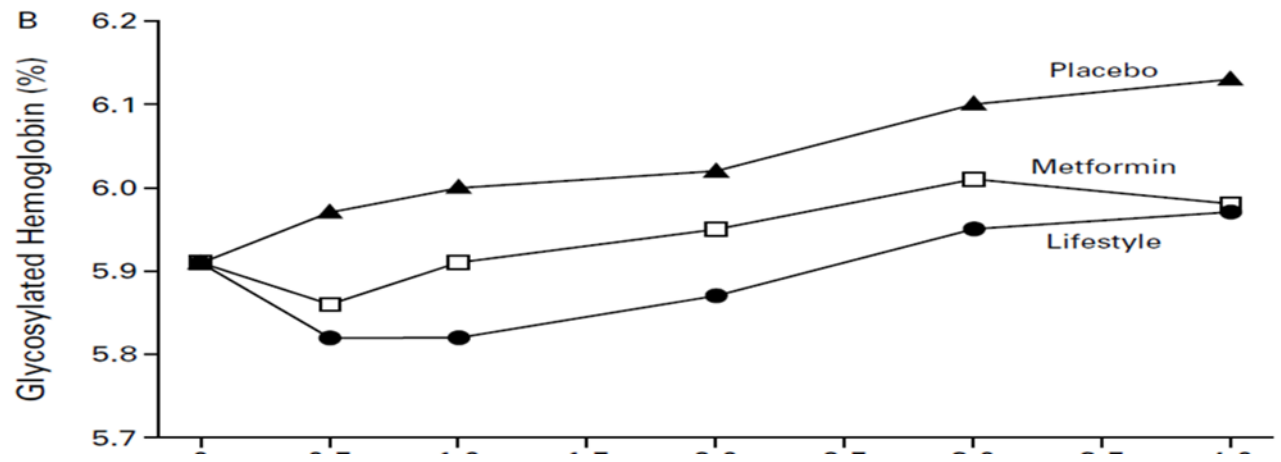
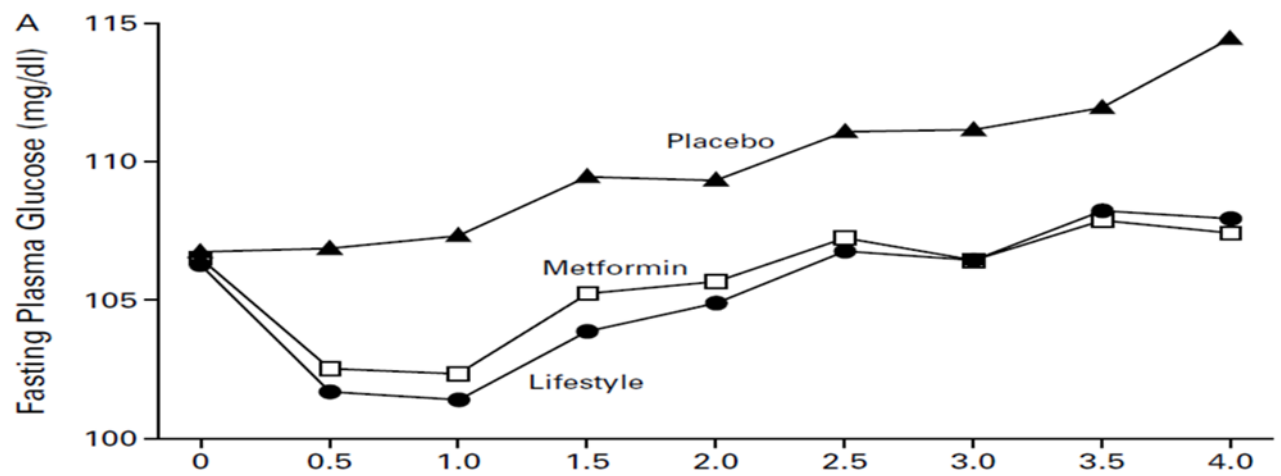
# Health benefits of physical activity: the evidence

CMAJ • MARCH 14, 2006 • 174(6)

Darren E.R. Warburton, Crystal Whitney Nicol, Shannon S.D. Bredin



**Fig. 1:** Relative risks of death from any cause among participants with various risk factors (e.g., history of hypertension, chronic obstructive pulmonary disease [COPD], diabetes, smoking, elevated body mass index [BMI  $\geq 30$ ] and high total cholesterol level [TC  $\geq 5.70$  mmol/L] who achieved an exercise capacity of less than 5 METs (metabolic equivalents) or 5–8 METs, as compared with participants whose exercise capacity was more than 8 METs. Error bars represent 95% confidence intervals. Adapted, with permission, from Myers et al<sup>38</sup> (*N Engl J Med* 2002;346:793–801). Copyright © 2002 Massachusetts Medical Society. All rights reserved.



# Hreyfing sem meðferð



## Ágæti læknakandidat

Um leið og við bjóðum þig velkominn í starfsnám í heilsugæslunni viljum við minna á hreyfiseðilinn.

Læknar í heilsugæslunni geta ávísað hreyfingu sem meðferð, kallað hreyfiseðill. Við viljum hvetja þig til að kynna þér rit sem heitir FYSS (fysisk aktivitet I sjukdomsprevention och sjukdomsbehandling) og er á netinu fyss.se. Þar er að finna ítarlegar upplýsingar um hreyfingu sem fyrirbyggjandi úrræði og sem meðferð við allmörgum sjúkdómum. Um er að ræða algenga sjúkdóma eins og fullorðinssykursýki, háþrýsting, vægt þunglyndi, offitu, þráláta verki, beinþynningu, langvinna lungnateppu, astma osfrv.

Teljir þú ábendingu fyrir hreyfingu sem meðferð eða hluta af meðferð hjá sjúklingi getur þú ávísað hreyfiseðli.

Þú þarft að fylla út hreyfiseðilseyðublað (í bréfaflipa Sögu) og skrá sjúkling í viðtal hjá hreyfistjóra í bókunarkerfinu. Hreyfistjórinn (sem er reyndur sjúkraþjálfari með þekkingu á áhugahvetjandi samtölum) á 1 klst viðtal við sjúkling, gerir mat á hans stöðu m.a. með 6 mín gönguprófi og þeir leggja síðan upp plan um hreyfingu skv. forskrift FYSS og miðað við getu viðkomandi. Sjúklingur skráir hreyfinguna í mínar síður í heilsuveru og hreyfistjórinn fylgist með frammistöðu hans og hefur samband eftir þörfum, hvetur og lagar prógrammið eftir þörfum. Tilvísandi læknir fær skýrslu um gang mála á 3 mán fresti og við útskrift úr hreyfiseðli. Við hvetjum þig til að nýta þér þetta meðferðarúrræði og hvetjum þig til að hafa samband við hreyfistjóran á þinni heilsugæslustöð eða undirritaðan ef einhverjar spurningar vakna.

Jón Steinar Jónsson yfirlæknir Þróunarmiðstöðvar íslenskrar heilsugæslu (jonsteinar@hg.is)

# Með tilliti til þeirra gagna sem fyrir liggja:

Med utgångspunkt från dessa resultat bör hälso- och sjukvårdspersonal använda två nivåer av insatser till patienter som behöver öka sin fysiska aktivitet i förebyggande och behandlande syfte:

- I. Till det stora flertalet erbjuds FaR, det vill säga patientcentrerade samtal och en individanpassad skriftlig ordination av fysisk aktivitet som patienten bedriver på egen hand (vardagsaktivitet eller organiserad aktivitet).
- IIa. För de patienter som behöver utökat stöd för att komma i gång med fysisk aktivitet, erbjuds träningsgrupper inom vården som ett första steg.
- IIb. FaR kan därefter underlätta övergången från strukturerad träning inom vården, till att individen blir varaktigt fysiskt aktiv på egen hand.

4.

VETENSKAPLIGT STÖD FÖR FAR

Heilbrigðisstarfsmenn eiga að bjóða þeim sjúklingum sem þurfa að auka hreyfingu í fyrirbyggjandi skyni eða meðferðarskyni úrræði

I. Flestum ætti að bjóða hreyfiseðil

IIa Sumum þjálfun í hópum

IIb Markmiðið að íhlutunin endi með viðvarandi aukinni hreyfingu á eigin vegum



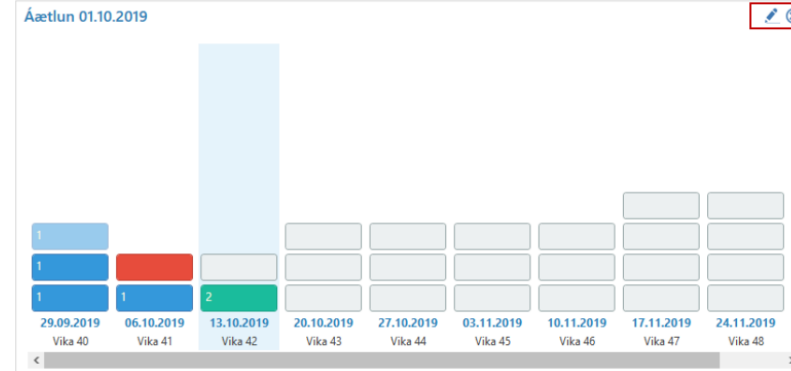
# Hreyfing sem meðferð Ábendingar fyrir hreyfiseðli

- Sykursýki II
- Þunglyndi og kvíði
- Hár blóðþrýstingur
- Hjartasjúkdómar
- Offita
- Stoðkerfissjúkdómar
- Langvinn lungnateppa
- Beinþynning
- Krabbamein

**HREYFISAGA**

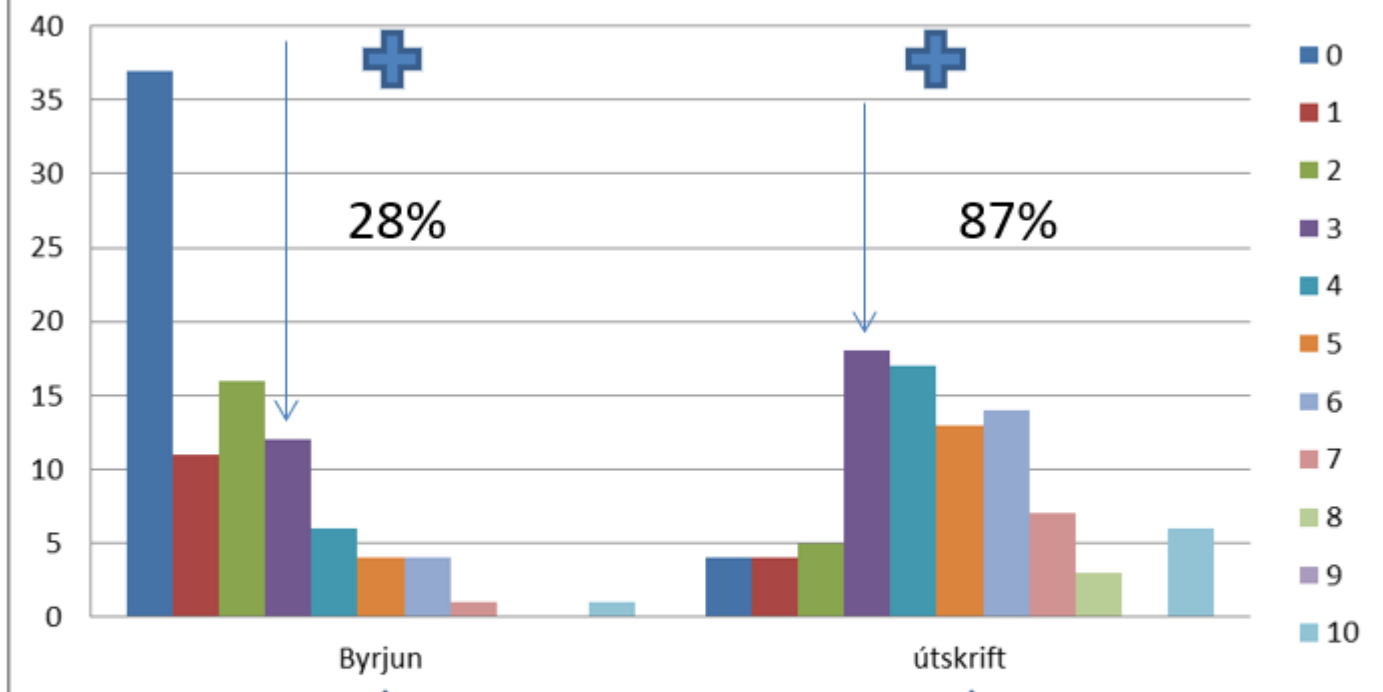
Hreyfiseðill			
Almennar lyflækningar			
<b>Persónuupplýsingar</b>			
Nafn	Sími	Kennitala	
Jóna Jónsdóttir		010170-5599	
Húsi	Farsími	Vinnusími	
Borgartún 37, 105 Reykjavík			
Starf	Netfang		
<b>Ábending/ur fyrir hreyfiseðil</b>			
#1	Helt	Kóði	
	Brot á framristarbeini	S92.3	
<b>Aðrar sjúkdómsgreiningar</b>			
#1	Helt	Kóði	
	Mæði	R06.0	
<b>Lyf</b>			
#1	Helt	Kóði	Styrkur
	Ibuxín	M01AE01	600 mg
			Ta / Mo
			Sk / Há
			Síðdegi
			Kvöld
<b>Rannsóknaniðurstöður</b>			
<b>Sjúkrasaga og skoðun</b>			
<b>Atriði sem kalla á varúð hjá þjálfara</b>			
<b>Endurkoma</b>			
Endurkoma:			
Sjúklingur á að bóka endurkomu má eftir:			
<input type="radio"/>	1 mánuð	<input checked="" type="radio"/>	3 mánuði
<input type="radio"/>	2 mánuði	<input type="radio"/>	6 mánuði
<input type="radio"/>		<input type="radio"/>	12 mánuði
<b>Undirskrift</b>			
Númer	Starfsmaður	Starfsheiti	Útfyllt af
1932	Hjörtur Sturluson	Tunnutæknir	Hjörtur
<b>Aðsetur</b>			
Saga_skema - TMS - Theriak, S-Álma, 545-3300			
Daga	Undirskrift		
21.05.2014			

## Heilsuvera



- 1 - Hreyfistjóri skráði hreyfingu.
- 1 - Hreyfistjóri skráði hreyfingu og er þetta hreyfing sem var aukadagur miðað við það sem áætlað var.
- 1 - Engin hreyfing skráð.
- 2 - Einstaklingur skráði hreyfingu og hreyfði sig tvisvar sama daginn.
- 1 - Einstaklingur skráir sjálfur og hreyfir sig aukalega einn dag miðað við áætlun.
- 1 - Ekki hefur verið skráð hreyfing, þ.e. vika er ekki útrunnin og er eftir að skrá hreyfingu á dag.

## Virgni hreyfiseðilsjúklinga



Langtíma áhrif hreyfiseðils á virgni á HAK  
Fjölur Guðmannsson, Ósk Jórunn Árnadóttir, Jón Torfi Halldórsson

86 einstaklingar

Virknispurningar

2,1 í byrjun (86)

5,3 við útskrift (86)

4,0 eftir 6 mánuði (86)

4,5 eftir 12 mánuði (43)

4,3 eftir 18 mánuði (10)

10%  
+

43%  
+

# Physical activity prescription: a critical opportunity to address a modifiable risk factor for the prevention and management of chronic disease: a position statement by the Canadian Academy of Sport and Exercise Medicine

Jane S Thornton,<sup>1</sup> Pierre Frémont,<sup>2</sup> Karim Khan,<sup>3</sup> Paul Poirier,<sup>4</sup> Jonathon Fowles,<sup>5</sup> Greg D Wells,<sup>6</sup> Renata J Frankovich<sup>7</sup>

**Author note** This position statement has been endorsed by the following nine sport medicine societies: Australasian College of Sports and Exercise Physicians (ACSEP), American Medical Society for Sports Medicine (AMSSM), British Association of Sports and Exercise Medicine (BASEM), European College of Sport & Exercise Physicians (ECOSEP), Norsk forening for idrettsmedisin og fysisk aktivitet (NIMF), South African Sports Medicine Association (SASMA), Schweizerische Gesellschaft für Sportmedizin/Swiss Society of Sports Medicine (SGSM/SSSM), Sport Doctors Australia (SDrA), Swedish Society of Exercise and Sports Medicine (SFAIM), and CASEM.

## ABSTRACT

Non-communicable disease is a leading threat to global health. Physical inactivity is a large contributor to this problem; in fact, the WHO ranks it as the fourth leading risk factor for overall morbidity and mortality worldwide. In Canada, at least 4 of 5 adults do not meet the Canadian Physical Activity Guidelines of 150 min of moderate-to-vigorous physical activity per week.

Physicians play an important role in the dissemination of physical activity (PA) recommendations to a broad segment of the population, as over 80% of Canadians visit their doctors every year and prefer to get health information directly from them. Unfortunately, most physicians do not regularly assess or prescribe PA as part of routine care, and even when discussed, few provide specific recommendations. PA prescription has the potential to be an important therapeutic agent for all ages in primary, secondary and tertiary prevention of chronic disease. Sport and exercise medicine (SEM) physicians are particularly well suited for this role and should collaborate with their primary care colleagues for optimal patient care. The purpose of this Canadian Academy and Sport and Exercise Medicine position statement is to provide an evidence-based, best practices summary to better equip SEM and primary care physicians to prescribe PA and exercise, specifically for the prevention and management of non-communicable disease. This will be achieved by addressing common questions and perceived barriers in the field.

Prescription of physical activity (PA) is a key element of the multifaceted societal approach needed to address inactivity.<sup>4-5</sup> Substantial evidence exists to support the benefits of exercise on at least 30 chronic diseases<sup>6-10</sup> as well as the cost-effectiveness of exercise prescription in primary care,<sup>11-12</sup> even for cardiovascular (CV) disease alone.<sup>13</sup>

Physicians play an important role in the dissemination of PA recommendations to a broad segment of the population. Over 80% of Canadians visit their doctors every year and prefer to get health information directly from their family physician.<sup>14-15</sup> Unfortunately, most physicians do not regularly assess or prescribe PA as a part of routine care,<sup>16-18</sup> and even when discussed, few provide specific recommendations.<sup>19</sup>

PA prescription has the potential to be an important therapeutic agent for all ages in primary, secondary and tertiary prevention of chronic disease. Sport and exercise medicine (SEM) physicians are particularly well suited for this role and should collaborate with their primary care colleagues for optimal patient care. We must act now to correct the general lack of knowledge and training in our medical schools and residency programmes surrounding PA guidelines and prescription<sup>20-23</sup> as well. The purpose of this Canadian Academy and

► Additional material is published online only. To view please visit the journal online (<http://dx.doi.org/10.1136/bjsports-2018-099598>).

For numbered affiliations see end of article.

## Correspondence to

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Accepted 26 October 2018

# Physical activity on prescription in accordance with the Swedish model increases physical activity: a systematic review

Aron Onerup,<sup>1</sup> Daniel Arvidsson,<sup>2</sup> Åse Blomqvist,<sup>3</sup> Eva-Lotte Daxberg,<sup>4</sup> Lennart Jivegård,<sup>5</sup> Ingibjörg H Jonsdottir,<sup>6</sup> Stefan Lundqvist,<sup>3</sup> Anders Mellén,<sup>7</sup> Josefine Persson,<sup>8</sup> Petteri Sjögren,<sup>5</sup> Therese Svanberg,<sup>9</sup> Mats Borjesson<sup>2,10</sup>

## ABSTRACT

**Objectives** This study investigates the effects of the core elements of the Swedish model for physical activity on prescription (PAP) by evaluating studies that compared adults who received PAP with adults who did not receive PAP. All participants were adults identified by a healthcare professional as in need of increased physical activity. Primary outcome was level of physical activity.

**Design** Systematic review.

**Eligibility criteria** (1) Published 1999. (2) Systematic review, randomised controlled trial (RCT), non-RCT or case series (for adverse events). (3) ≥12 weeks' follow-up. (4) Performed in the Nordic countries. (5) Presented in English, Swedish, Norwegian or Danish.

**Data sources** Systematic searches in PubMed, Embase, the Cochrane Library, AMED, CINAHL and SweMed+ in September 2017. Included articles were evaluated using checklists to determine risk of bias.

**Results** Nine relevant articles were included: seven RCTs, one cohort study and one case series. Primary outcome was reported in seven articles from six studies (five RCTs, one cohort study, 642 participants). Positive results were reported from three of the five RCTs and from the cohort study. No study reported any negative results. Swedish PAP probably results in an increased level of physical activity (GRADE⊕⊕⊕○).

**Conclusions** Although the number of the reviewed articles was relatively modest, this systematic review shows that PAP in accordance with the Swedish model probably increases the level of physical activity. As a model for exercise prescription, Swedish PAP may be considered as part of regular healthcare to increase physical activity in patients.

## What is already known

- Physical inactivity is the fourth leading cause of non-communicable disease worldwide according to the WHO.
- A large part of the population in industrialised countries, including the population in contact with healthcare, is insufficiently physically active.
- Methods to increase the level of physical activity in patients have shown mixed results in previous systematic reviews and therefore new methods are needed.

## What are the new findings

- The present systematic review shows that the Swedish physical activity on prescription (PAP) method probably increases the level of physical activity in adult patients who are insufficiently active (GRADE⊕⊕⊕○).
- We suggest that the Swedish PAP model be used in the healthcare setting to increase the level of physical activity and be implemented as part of routine healthcare.

Although global consensus concludes that inadequate PA can cause health problems and that increased PA can improve health, evidence is still lacking with regard to optimal methods for increasing PA for people who would benefit from

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Accepted 3 June 2016  
Published Online First  
22 June 2016



# Are physical activity interventions in primary care and the community cost-effective?

A systematic review of the evidence

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## RESEARCH

### ABSTRACT

#### Background

The health and economic burden of physical inactivity is well documented. A wide range of primary care and community-based interventions are available to increase physical activity. It is important to identify which components of these interventions provide the best value for money.

#### Aim

To assess the cost-effectiveness of physical activity interventions in primary care and the community.

#### Design of study

Systematic review of cost-effectiveness studies based on randomised controlled trials of interventions to increase adult physical activity that were based in primary health care or the community, completed between 2002 and 2009.

#### Method

Electronic databases were searched to identify relevant literature. Results and study quality were assessed by two researchers, using Drummond's checklist for economic evaluations. Cost-effectiveness ratios for moving one person from inactive to active, and cost-utility ratios (cost per quality-adjusted life-year [QALY]) were compared between interventions.

#### Results

Thirteen studies fulfilled the inclusion criteria. Eight studies were of good or excellent quality. Interventions, study populations, and study designs were heterogeneous, making comparisons difficult. The cost to move one person to the 'active' category at 12 months was estimated for four interventions ranging from €331 to €3673. The cost-utility was estimated in nine studies, and varied from €348 to €66 877 per QALY.

#### Conclusion

Most interventions to increase physical activity were cost-effective, especially where direct supervision or instruction was not required. Walking, exercise groups, or brief exercise advice on prescription delivered in person, or by phone or mail appeared to be more cost-effective than supervised gym-based exercise classes or instructor-led walking programmes. Many physical activity interventions had similar cost-utility estimates to funded pharmaceutical interventions and should be considered for funding at a similar level.

#### Keywords

costs and cost analysis; exercise; primary health care; review, systematic.

### INTRODUCTION

The prevalence of physical inactivity remains high in developed and developing countries.<sup>1</sup> Not only does physical inactivity contribute to increased prevalence of chronic conditions such as cardiovascular disease, obesity, type 2 diabetes, osteoporosis, colon cancers, depression, and fall-related injuries, but it also contributes to between 1.5% and 3.0% of direct healthcare costs in developed countries.<sup>1</sup> A wide range of interventions have been shown to increase physical activity.<sup>2</sup> However, it is essential to identify which components provide the best value for money.

Physical activity counselling in primary health care has been recommended.<sup>3</sup> In some countries at least 80% of the population visit primary health care annually,<sup>4,5</sup> making this an ideal setting for intervening to increase physical activity. Furthermore, patients expect to receive health-related messages in this

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Submitted: 23 March 2010; Editor's response: 24 May 2010; final acceptance: 27 July 2010.

©British Journal of General Practice

This is the full-length article (published online 28 Feb 2011) of an abridged version published in print. Cite this article as: *Br J Gen Pract* 2011; DOI: 10.3399/bjgp11X561249.

## Comparative effectiveness of exercise and drug interventions on mortality outcomes: metaepidemiological study

OPEN ACCESS

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### Abstract

**Objective** To determine the comparative effectiveness of exercise versus drug interventions on mortality outcomes.

**Design** Metaepidemiological study.

**Eligibility criteria** Meta-analyses of randomised controlled trials with mortality outcomes comparing the effectiveness of exercise and drug interventions with each other or with control (placebo or usual care).

**Data sources** Medline and Cochrane Database of Systematic Reviews, May 2013.

**Main outcome measure** Mortality.

**Data synthesis** We combined study level death outcomes from exercise and drug trials using random effects network meta-analysis.

**Results** We included 16 (four exercise and 12 drug) meta-analyses. Incorporating an additional three recent exercise trials, our review collectively included 305 randomised controlled trials with 339 274 participants. Across all four conditions with evidence on the effectiveness of exercise on mortality outcomes (secondary prevention of coronary heart disease, rehabilitation of stroke, treatment of heart failure, prevention of diabetes), 14 716 participants were randomised to physical activity interventions in 57 trials. No statistically detectable differences were evident between exercise and drug interventions in the secondary prevention of coronary heart disease and prediabetes. Physical activity interventions were more effective than drug treatment among patients with stroke (odds ratios, exercise v anticoagulants 0.09, 95% credible intervals 0.01 to 0.70 and exercise v antiplatelets 0.10, 0.01 to 0.62). Diuretics were more effective than exercise in heart failure (exercise v diuretics 4.11, 1.17 to 24.76). Inconsistency between direct and indirect comparisons was not significant.

**Conclusions** Although limited in quantity, existing randomised trial evidence on exercise interventions suggests that exercise and many drug interventions are often potentially similar in terms of their mortality

benefits in the secondary prevention of coronary heart disease, rehabilitation after stroke, treatment of heart failure, and prevention of diabetes.

### Introduction

Physical activity has well documented health benefits.<sup>1</sup> Population level cohort studies have shown that people who exercise enjoy a higher quality of life and improved health status compared with those with sedentary behaviours, with subsequent reductions in their risk of adverse outcomes such as admissions to hospital. Randomised controlled trials have shown similarly favourable findings in arthritis,<sup>2</sup> cancer,<sup>3-5</sup> diabetes,<sup>6</sup> heart disease,<sup>6</sup> and respiratory illnesses,<sup>7</sup> among other chronic conditions.<sup>8-9</sup> Large scale observational studies have also established a clear association between exercise and all cause mortality.<sup>10-12</sup> Given the overwhelming evidence in support of the health benefits of exercise,<sup>13</sup> the Global Burden of Disease study has recently ranked physical inactivity as the fifth leading cause of disease burden in western Europe, and as one of the top modifiable risk factors along with smoking.<sup>14</sup>

Despite recent calls to encourage physical activity as a strategy to ward off the emerging burden of chronic conditions, including heart disease and diabetes,<sup>15</sup> population level physical activity measures are discouraging. In the United Kingdom, only 14% of adults exercise regularly, with roughly one third of adults in England meeting recommended levels of physical activity.<sup>16</sup> In contrast, utilisation rates of prescription drugs continue to rise sharply, increasing to an average of 17.7 prescriptions for every person in England in 2010, compared with 11.2 in 2000.<sup>17</sup>

Abundant evidence from randomised controlled trials shows the mortality benefits of certain drugs such as simvastatin in the secondary prevention of cardiovascular disease,<sup>18</sup> which is





## Effectiveness of physical activity promotion interventions in primary care: A review of reviews<sup>☆</sup>

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### ARTICLE INFO

Available online 26 September 2014

**Keywords:**  
Physical activity  
Health promotion  
Primary care  
Review

### ABSTRACT

**Objective.** The present review aims to summarize the evidence about the effectiveness of physical activity (PA) promotion interventions in primary care (PC) and the intervention or sample characteristics associated with greater effectiveness.

**Methods.** MEDLINE, EMBASE, and Cochrane Library were searched to identify systematic reviews and meta-analyses published from 2002 to 2012 that assessed the effectiveness of PA-promoting interventions in PC. Information was extracted and recorded about each of the selected studies and their reported results. Methodological and evidence quality was independently rated by two reviewers using the nine-item OQAQ scale and the SIGN classification system.

**Results.** Ten of the 1664 articles identified met the inclusion criteria: five meta-analyses, three systematic reviews, and two literature reviews. Overall, PA promotion interventions in PC showed a small to moderate positive effect on increasing PA levels. Better results were obtained by interventions including multiple behavioral change techniques and those targeted to insufficiently active patients. No clear associations were found regarding intervention intensity or sample characteristics.

**Conclusion.** Although several high-quality reviews provided clear evidence of small but positive effects of PA intervention in PC settings, evidence of specific strategies and sample characteristics associated with greater effectiveness is still needed to enhance the implementation of interventions under routine clinical conditions.

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### Background

The numerous health benefits of regular physical activity (PA) are well known. Accordingly, it is recommended that adults perform at least 150 min/week of moderate-intensity PA, 75 min/week of vigorous PA, or a combination of moderate and vigorous PA (Haskell et al., 2007). However, a majority of the population in developed countries does not follow these recommendations, making PA promotion a public health priority (Tucker et al., 2011; Hallal et al., 2012).

Primary care (PC) practitioners can play a key role in promoting PA and improving population health in developed countries because of the ongoing care they provide to a large sector of the population (Estabrooks et al., 2003). It is estimated that up to 80% of adults in these countries visit their general practitioner (GP) at least once a year

(van Doorslaer et al., 2006). Until recently, evidence about the effectiveness of interventions promoting PA in routine PC practice, especially in the long term, has been considered inconclusive (Foster et al., 2005; Muller-Riemenschneider et al., 2008). Newer studies have concluded in favor of PA interventions in the primary care setting, and recent meta-analyses indicate that the evidence appears to be shifting in this direction (Lin et al., 2010; Orrow et al., 2012; Hillsdon, 2013).

The high prevalence of inactivity in the population and the many obstacles faced by PC professionals in a setting characterized by work overload and a shortage of time and specialized training (Estabrooks and Glasgow, 2006; Grandes et al., 2008) combine to support the need for clear evidence of what can be achieved in PA promotion within primary care settings. Nonetheless, several challenges exist. First, there is no clear agreement among PC organizations and evidence-gathering agencies on the recommendations for PA promotion within the PC context. For example, the United States Preventive Services Task Force (USPSTF) currently recommends selective PA counseling rather than incorporating the message into routine practice in the general population (Moyer and U.S. Preventive Services Task Force, 2012); the United Kingdom's National Institute for Health and Clinical Excellence (NICE) also recommends that the National Health Service provides brief advice to adults who have been assessed as being inactive (National Institute for Health and Care Excellence, 2013), but the Royal Australian College

<sup>☆</sup> Sources of support: The project has received funding from a Network for Prevention and Health Promotion in Primary Care (redIAPP, RD12/0005) grant, research project grants (P113/00573, P112/02635, P112/01914 and P509/01461) from the Instituto de Salud Carlos III (Institute of Health Carlos III) of the Ministry of Economy and Competitiveness (Spain), co-financed with European Union ERDF funds, and Health Department of the Basque Government (EXP: 2009111072 and 2007111009).

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## Using electronic/computer interventions to promote physical activity

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### ABSTRACT

The internet has been used as a method to deliver various health interventions (eg, weight management, smoking cessation, increasing physical activity). An electronic search (ie, PubMed, PsycInfo, Web of Science) for internet-based physical activity interventions among adults yields fewer than 25 studies. Although many have considered physical activity as one element of a multifactorial behavioural intervention, few have focused exclusively on changing sedentary behaviour. Overall, current results are encouraging and it appears that response to an internet-based physical activity intervention is similar to response to other more established, effective interventions. Given that primary care referrals for physical activity are successful in changing sedentary behaviour to some extent, there is an urgent need for investigations into the effect of using an internet-based physical activity programme within the context of primary care. Although no studies that have combined an established internet-based physical activity programme with primary care were found, there is evidence that significant progress would probably be made by providing clinicians with information on internet-based physical activity programmes.

There is now a growing body of literature on the use of the internet as a tool to promote health behaviour change. Researchers have used internet interventions for numerous topics including weight management, smoking cessation, stress reduction, blood glucose control, reducing alcohol consumption and increasing physical activity. Currently, interventions focused specifically on changing physical activity behaviour are in their infancy, with fewer than 15 randomised controlled trials having been conducted. Thus far, the studies completed suggest that internet programmes are helpful in changing sedentary behaviour. However, more studies with larger samples and individualised treatment plans are needed,<sup>1,2</sup> including those that take into account how primary care can facilitate a change in behaviour by utilising internet-based health-promoting resources. In this review, we describe several internet-based studies that have produced a beneficial effect on changing participants' physical activity behaviour and we present some of the limitations of these studies.

### INTERNET USE

Worldwide, it is estimated that 21.9% of the population (ie, roughly 1.5 billion) use the internet.<sup>3</sup> The USA and the UK are among the top 10 countries with the highest internet usage (the USA is ranked second and the UK is ranked seventh),<sup>3</sup> with 72% of US and 67% of UK internet users going online every day or almost every day. Although only 27% of internet users in the UK have looked for health information online,<sup>4</sup> approximately 80% of the internet users in the USA have reported searching for health information<sup>5</sup> and 44% have searched for information specifically about fitness and nutrition.<sup>6</sup> In both the USA and the UK, use is high among all age groups, with approximately 90% of younger individuals (aged 16–24 years) and up to 72% of older adults (aged 55 years and older) online.<sup>4,7</sup> Rates are similar for both genders, with 76% of men and 74% of women in the USA and 71% of men and 62% of women online in the UK.<sup>4,7</sup> Whereas there are some demographic differences among users; overall, the internet has broad reach in the USA. Although internet use is lower among those who live in a rural area (64% online), those with less than a high school education (38% online), or those with an annual income of less than US\$30 000 (61% online),<sup>8</sup> its use remains high among all racial/ethnic groups, with 76% of non-Hispanic whites, 60% of African Americans and 56% of Hispanics online. Moreover, among English-speaking Hispanics, internet use exceeds that of non-Hispanic whites (79% vs 76%).<sup>9</sup>

Given the above, it is clear that the internet can now be used to reach a very large number of individuals, covering a wide spectrum of the population. Moreover, because individuals' lifestyles often do not permit the time for office visits on health information and advice and physicians counsel only a minority of their patients about physical activity,<sup>10</sup> the internet can also provide a more time-efficient and convenient method of information delivery, particularly if it were to be paired with primary care. Yarnall and colleagues<sup>11</sup> estimated that providing preventive care alone, in keeping with evidence-based guidelines, may take up to 8 h per day for a primary care provider, highlighting the time constraints of activities such as physical activity counselling. As such, using the internet as a resource to provide physical activity advice or programming for those who would otherwise not receive it is now a potential possibility.



