

Orthopedics Update



19.04.2012

„Sportmedizin – für Einsteiger
und Fortgeschrittene“



Orthopedics Update

Programm

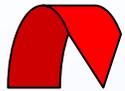
13.00	<i>Begrüssung</i>	C. Gerber
13.10	Bewegung – ein Medikament mit Nebenwirkung	W.O. Frey
13.50	Muskeltyp: Molekulare Erkenntnisse Bedeutung für die Praxis	H. Hoppeler
14.30	Ausdauer – Energiebereitstellung was der Orthopäde wissen muss	U. Boutellier
15.10	<i>Pause</i>	
15.30	Krafttraining – was der Orthopäde wissen muss	D. Schidbleicher
16.10	Belastungsdosierung im Leistungssport an Beispielen von Trainingskonzepten im alpinen Skirennsport	M. Vogt
16.50	Verletzungsfälle Alpiner Skirennsport Risikofaktoren und Präventionsstrategien	J. Spörri
17.30	<i>Pause</i>	
17.50	Ernährung im Sport - was der Orthopäde wissen muss	P. Colombani
18.30	Antidoping – was der Orthopäde wissen muss	M. Kamber
19.10	Der Orthopäde als Clubarzt	W.O. Frey
19.30	<i>ENDE/ Apéro im Foyer</i>	



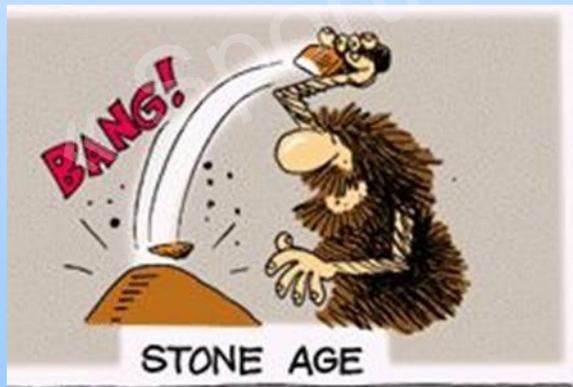
Bewegung

"ein Medikament mit Nebenwirkung"

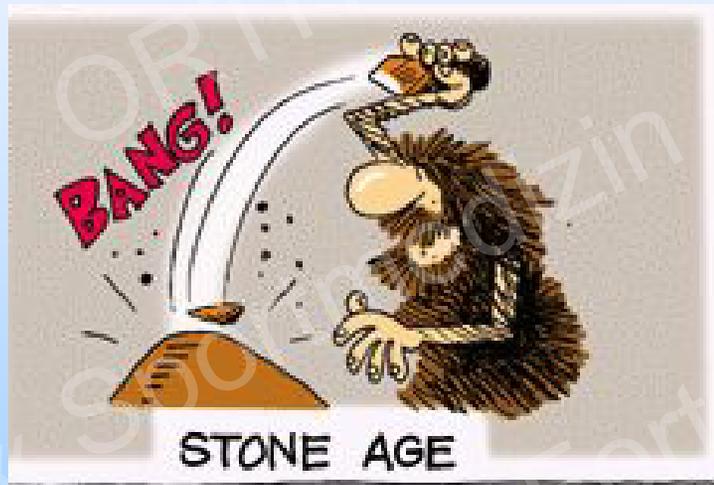
Dr.med. Walter O. Frey
balgrist move>med
Swiss Olympic Medical Center
8008 Zürich
www.movemed.ch



Fortschritt



2000 v. Chr.



Das Leben von

- Jäger Mike
- Sammler Gary



2000 v. Chr.

Nahrungsmenge

— Mike
körperliche
Aktivität

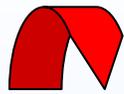
Schlemmen

Hungern

— Gary
körperliche
Aktivität

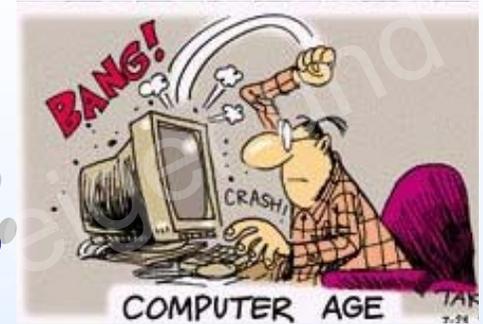


Chakravarthy MV; Booth FW; J.Appl.Phys 2004/96 3-10



Überleben des Aktivsten

2000 n. Chr.



Jäger Mike

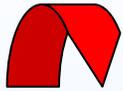
- EDV Fachmann
- Programmierer
- 3-4 Mahlzeiten / Tag
- 12-14 h sitzen / Tag
- Hobbies: TV

55 J: MI
Type II Diabetes
Erhöhter Blutdruck
Hohes Cholesterin

Sammler Gary

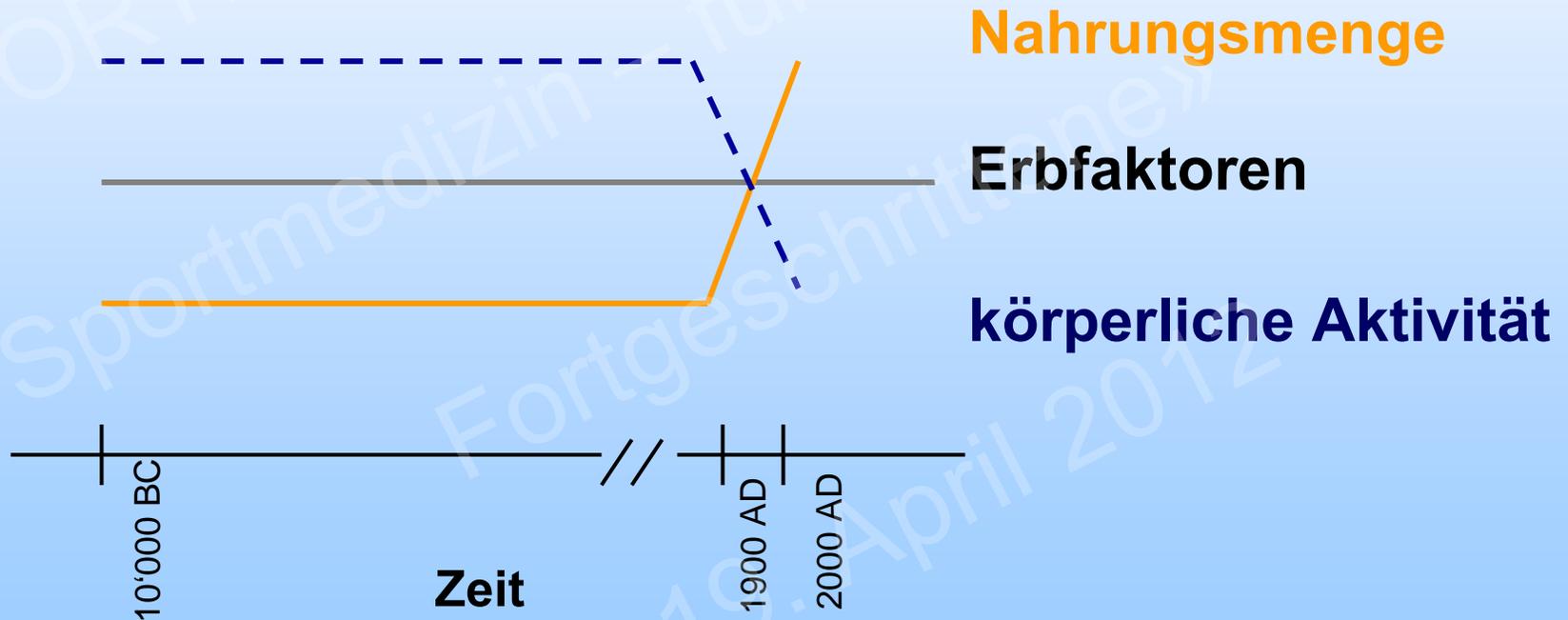
- Universitäts Professor
- Buch-Autor
- Hobbies: laufen:
Heim → Büro

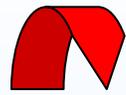
55 J: Start von
Marathon-Training



Überleben des Aktivsten

Sparsamkeits-Gen Hypothese





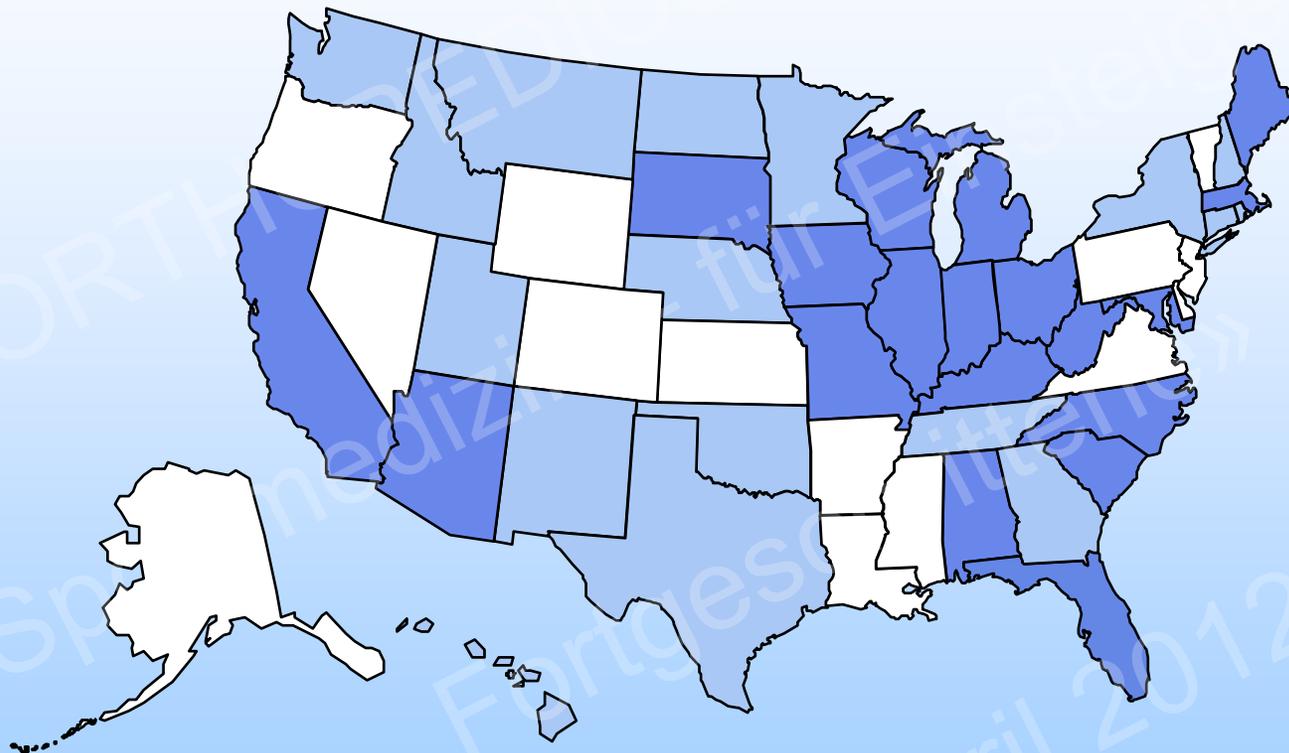
Faktoren für Gesundheit und hohes Lebensalter



Obesity Trends* Among U.S. Adults

BRFSS, 1988

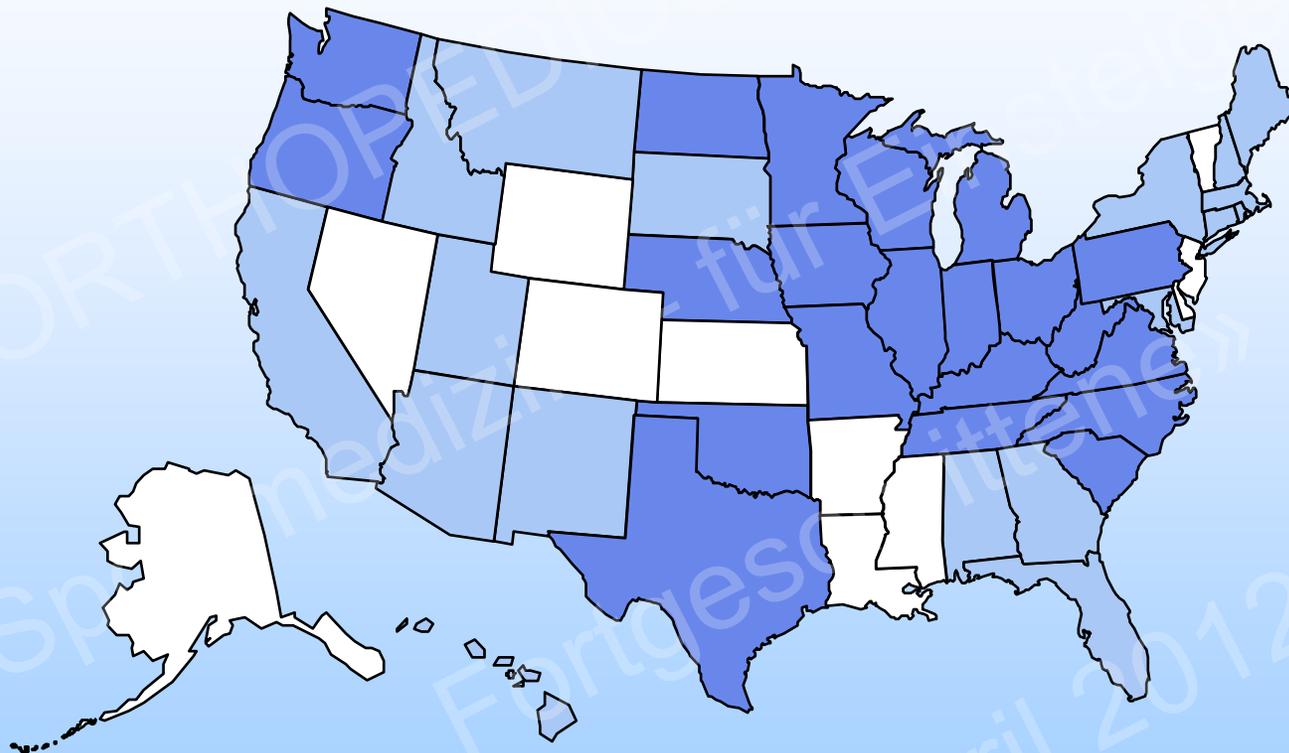
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1989

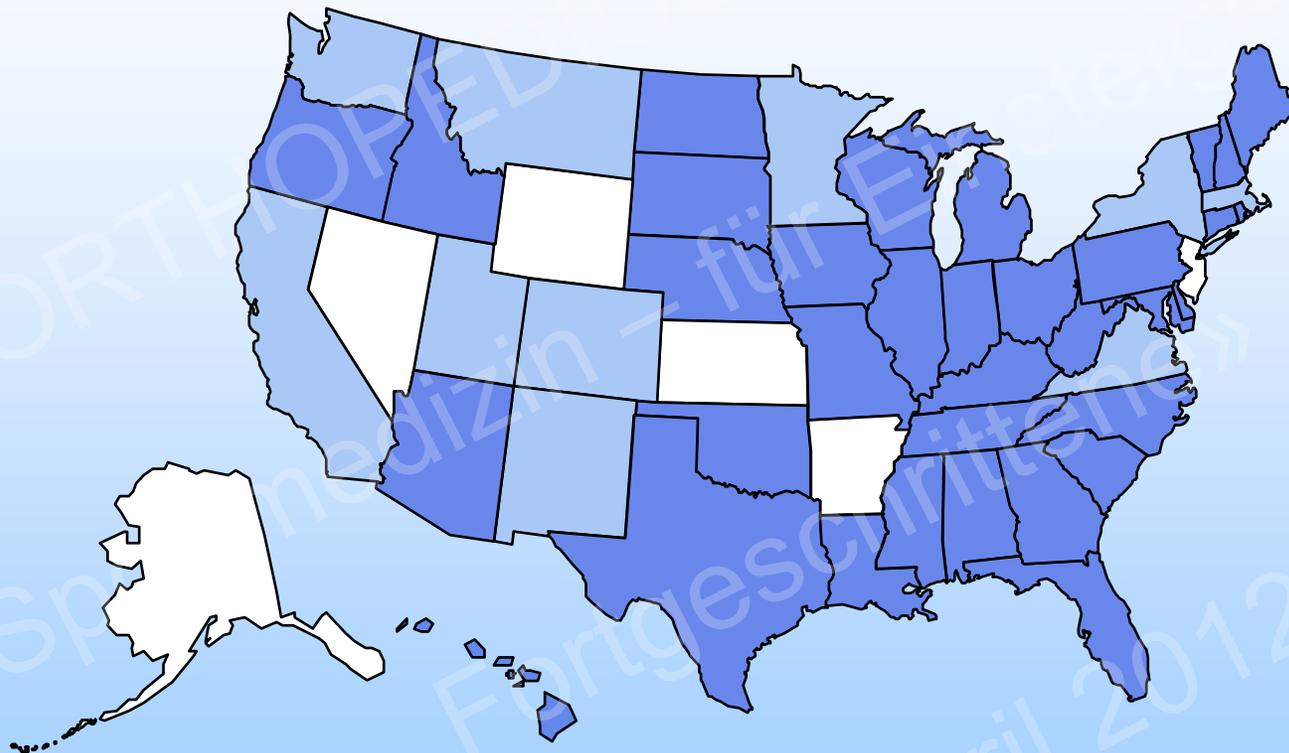
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Obesity Trends* Among U.S. Adults

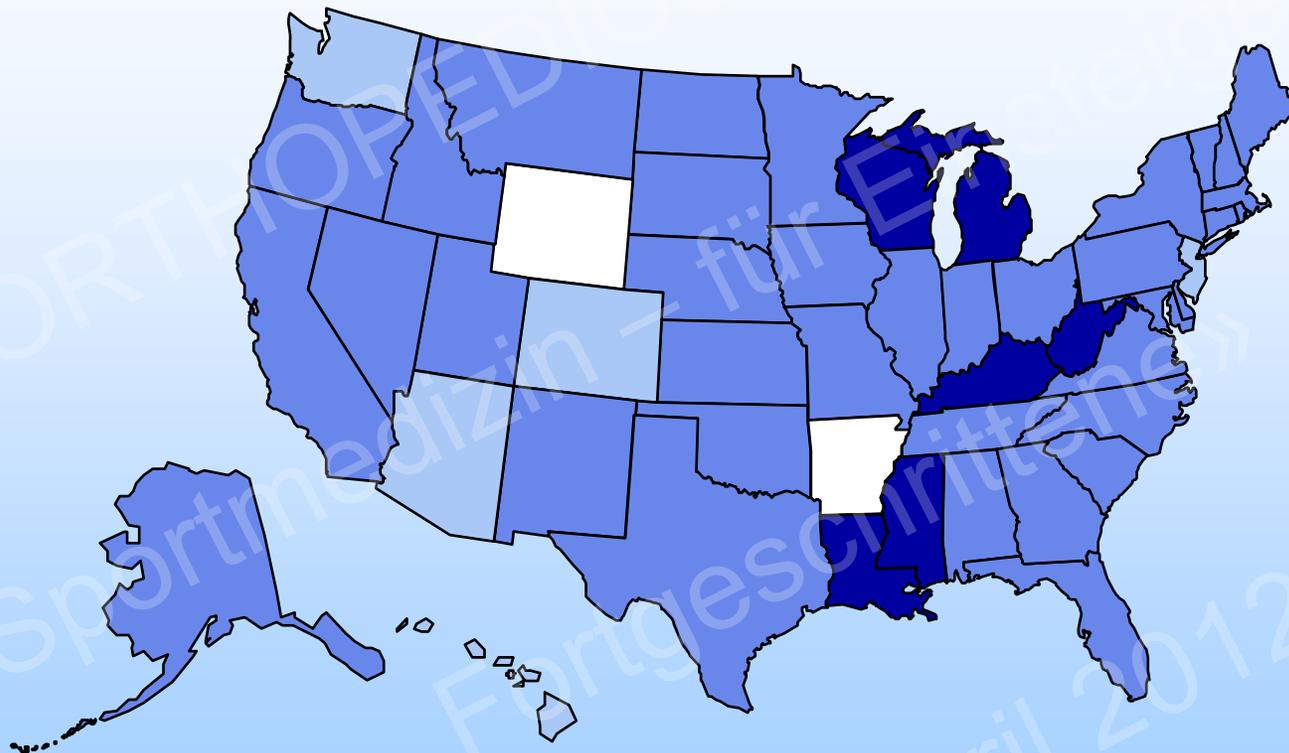
BRFSS, 1990

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



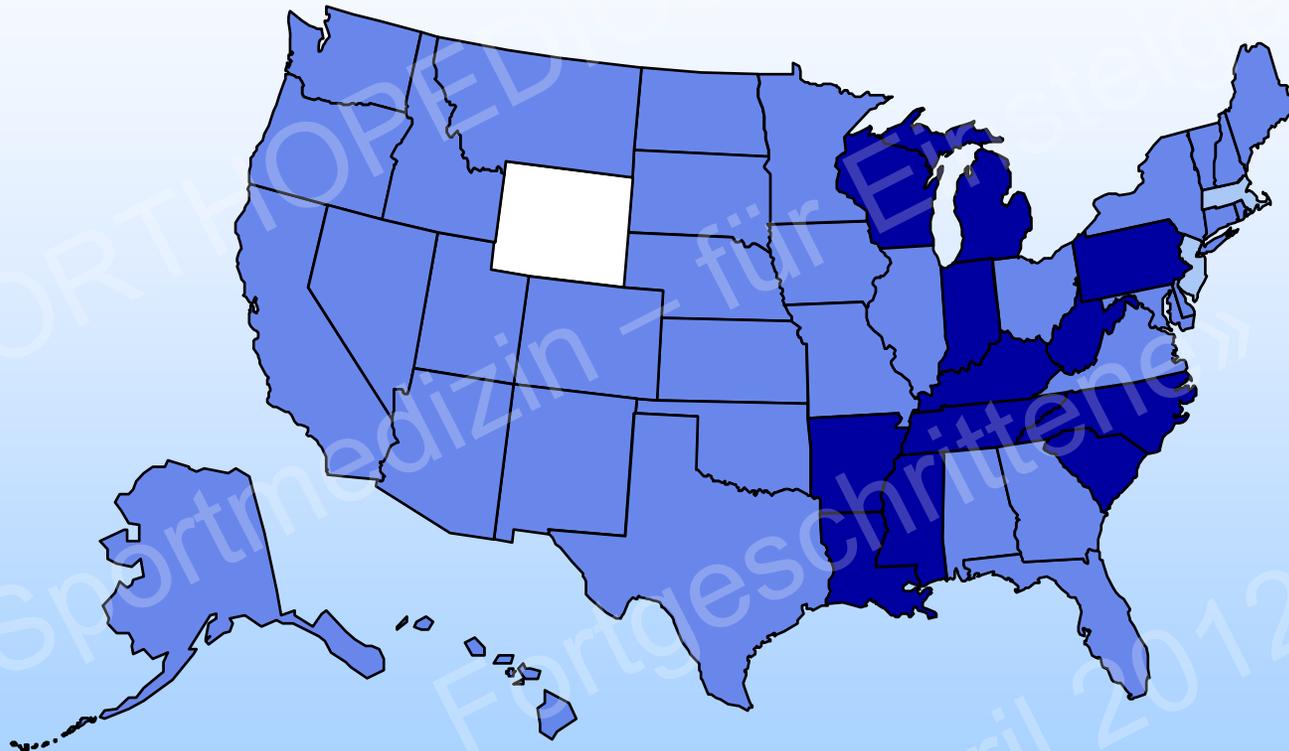
Obesity Trends* Among U.S. Adults BRFSS, 1992

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



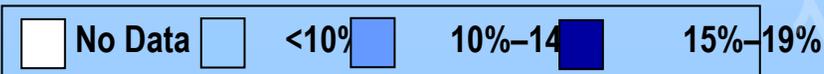
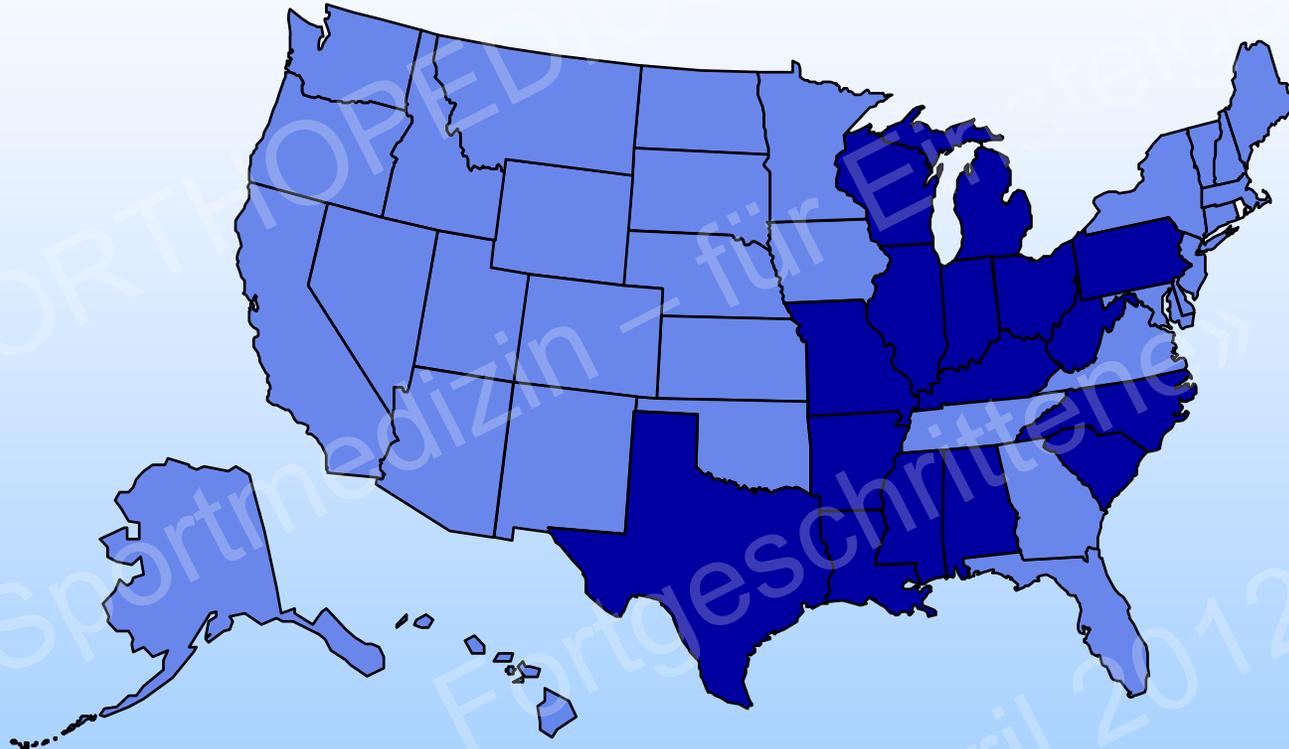
Obesity Trends* Among U.S. Adults BRFSS, 1993

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults BRFSS, 1994

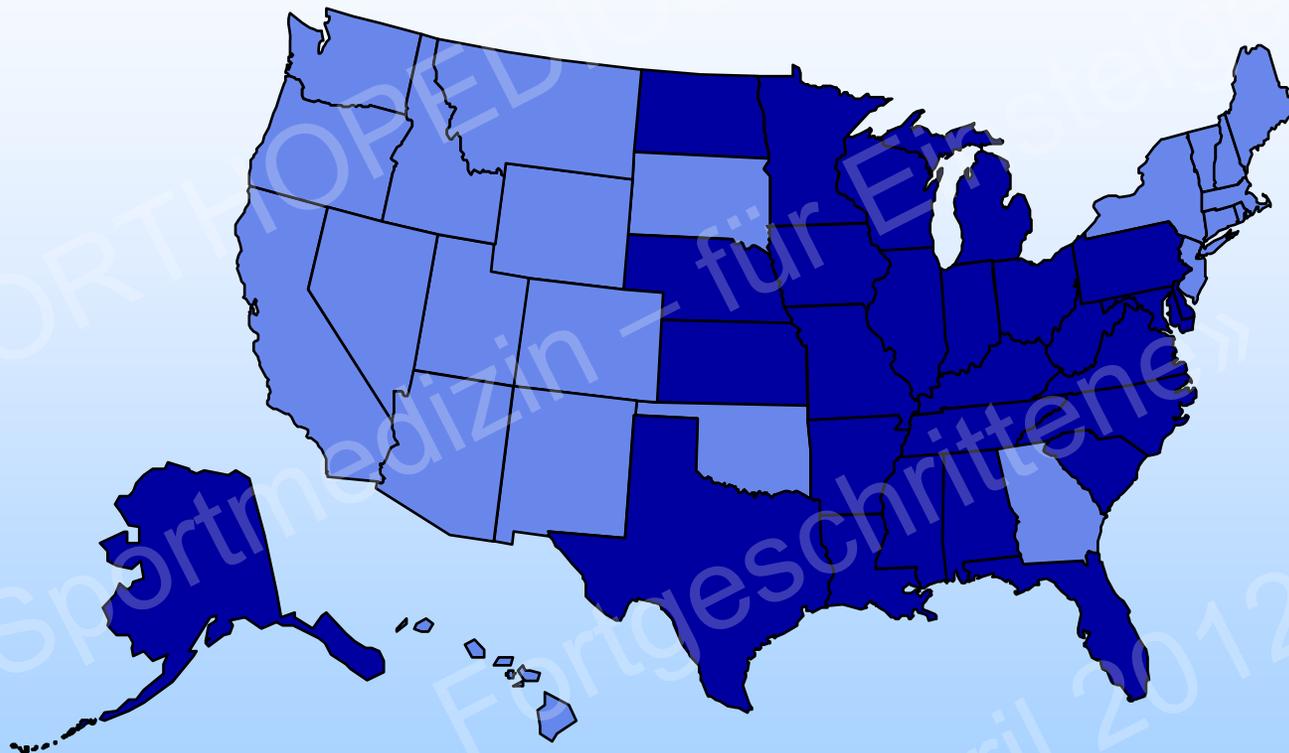
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1995

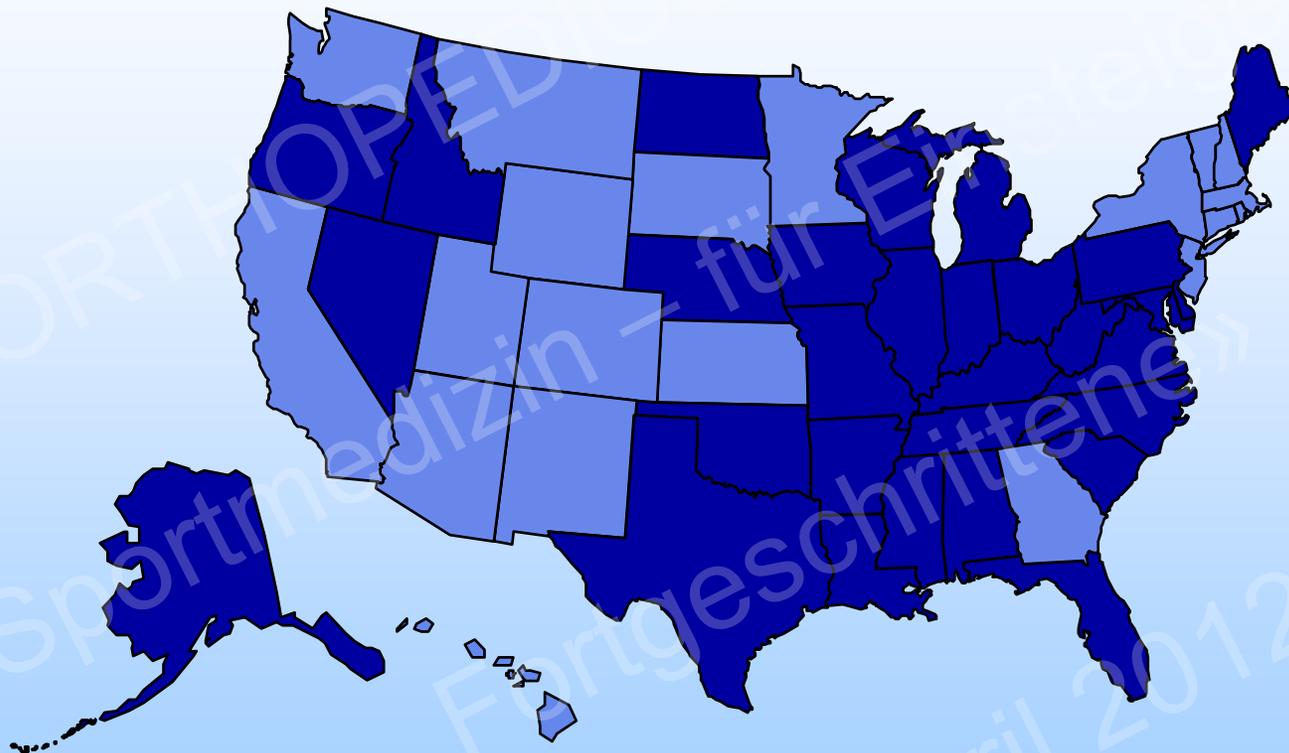
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1996

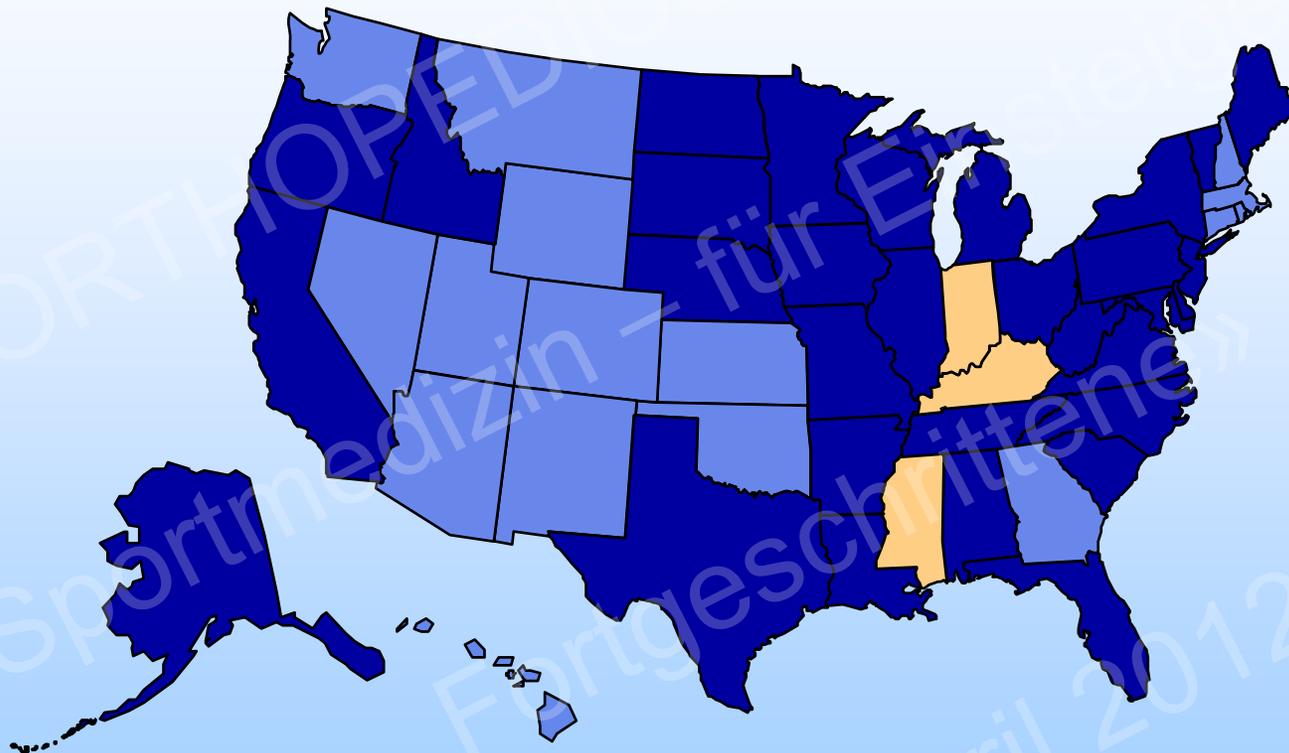
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

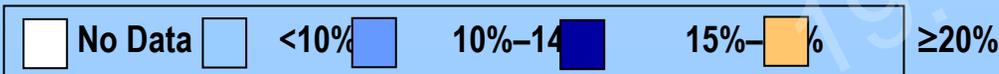
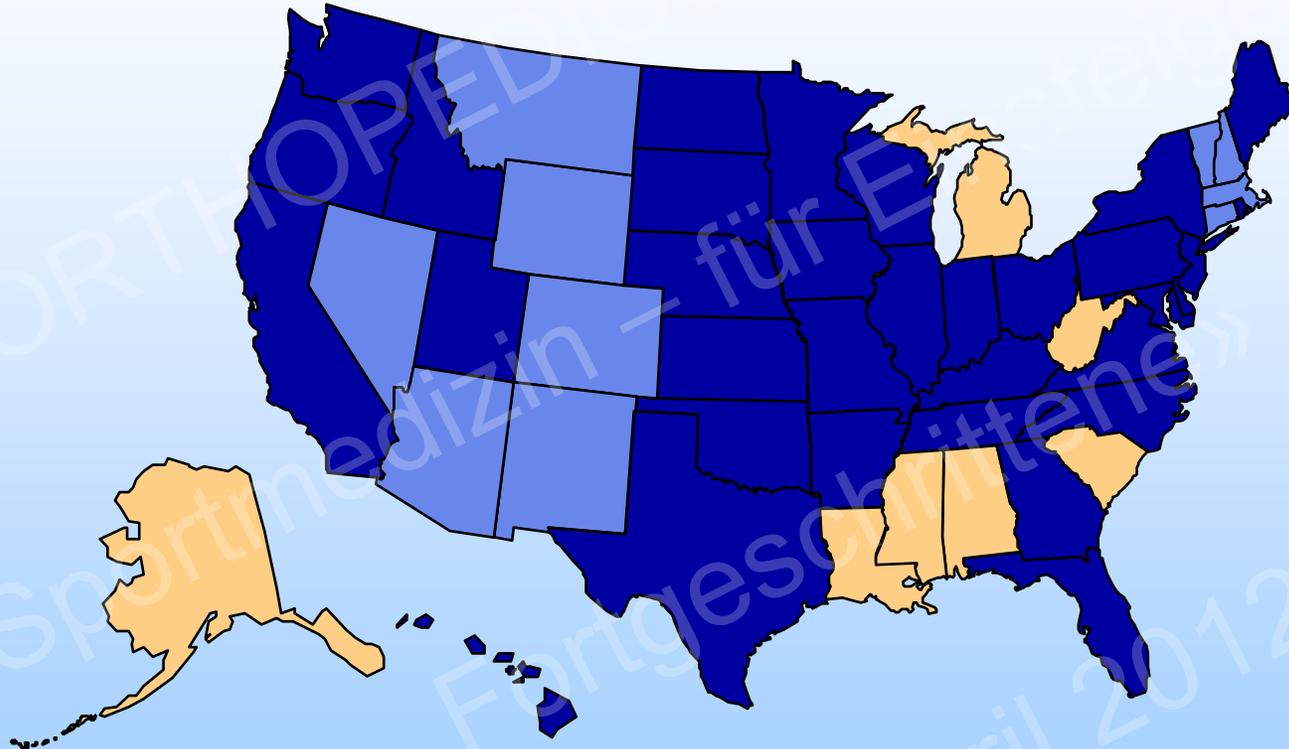
BRFSS, 1997

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults BRFSS, 1998

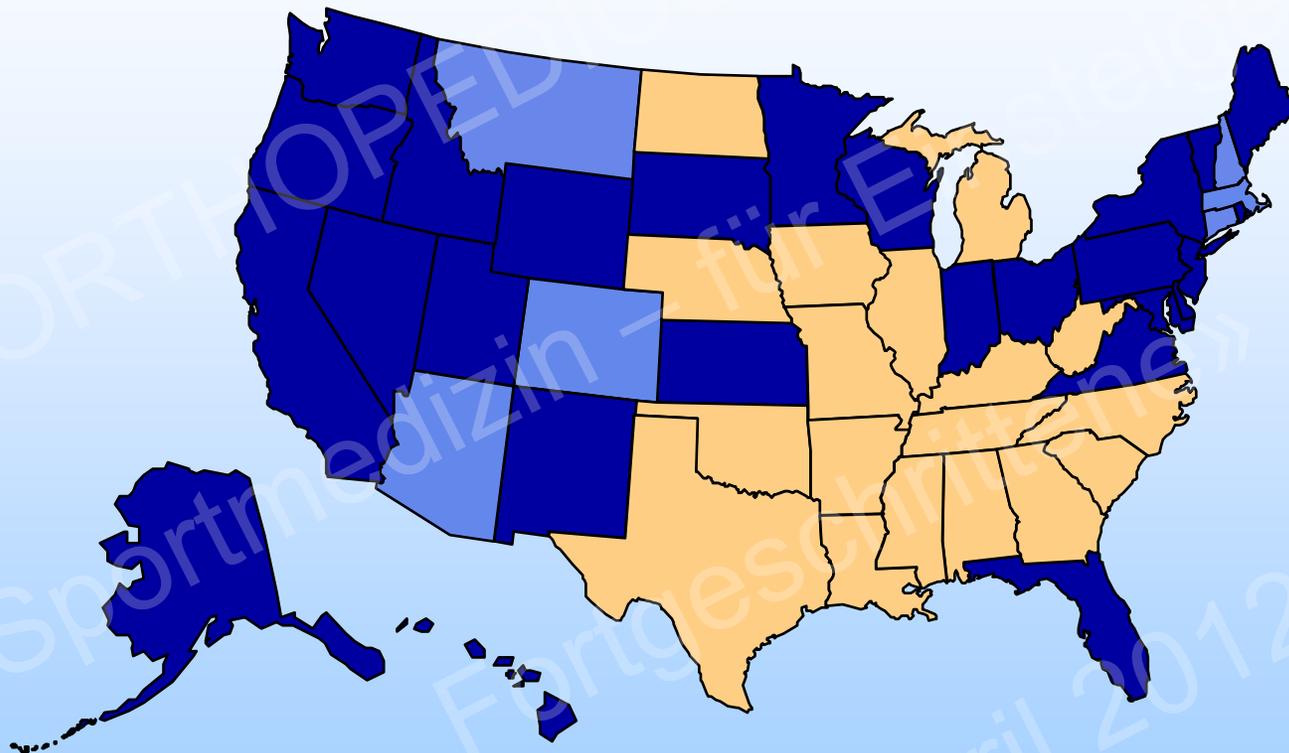
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 1999

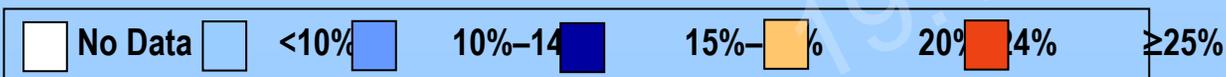
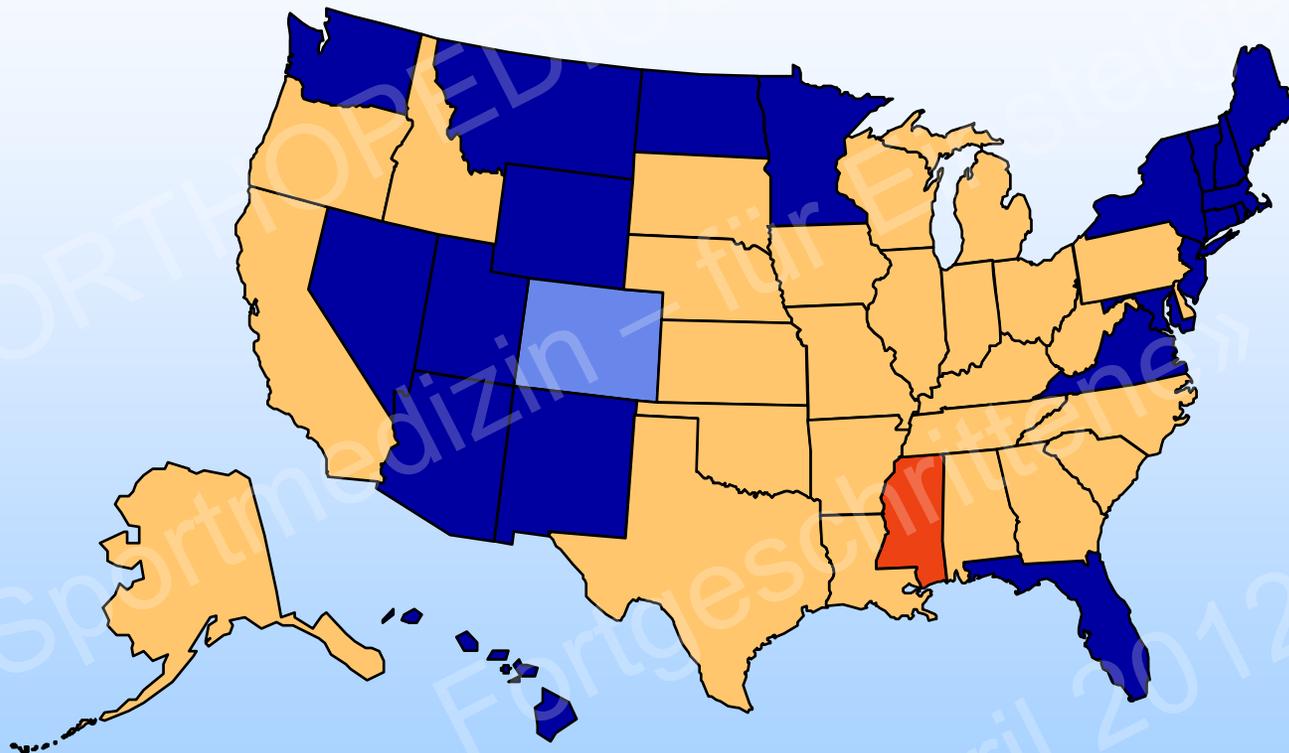
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

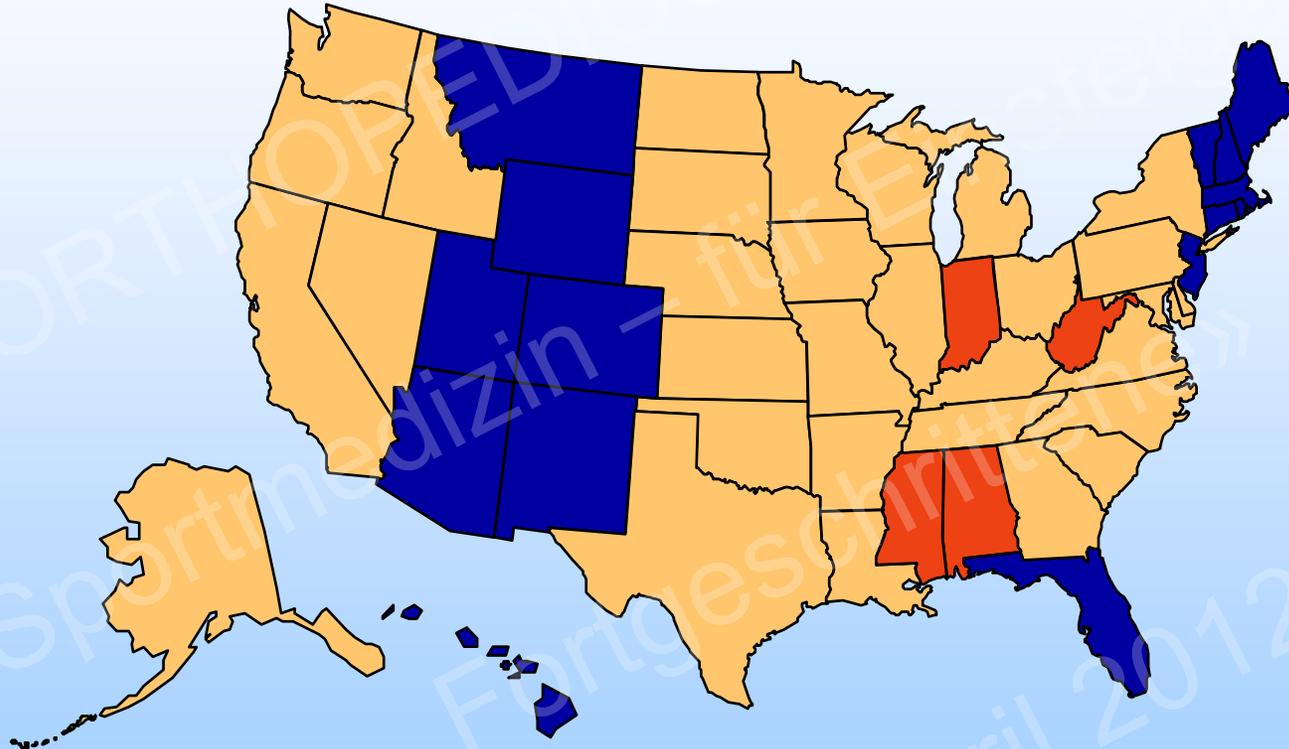
BRFSS, 2001

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults BRFSS, 2003

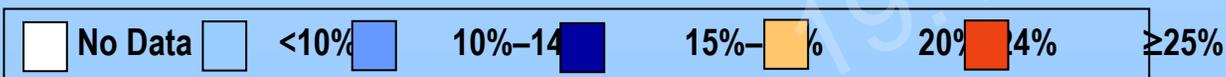
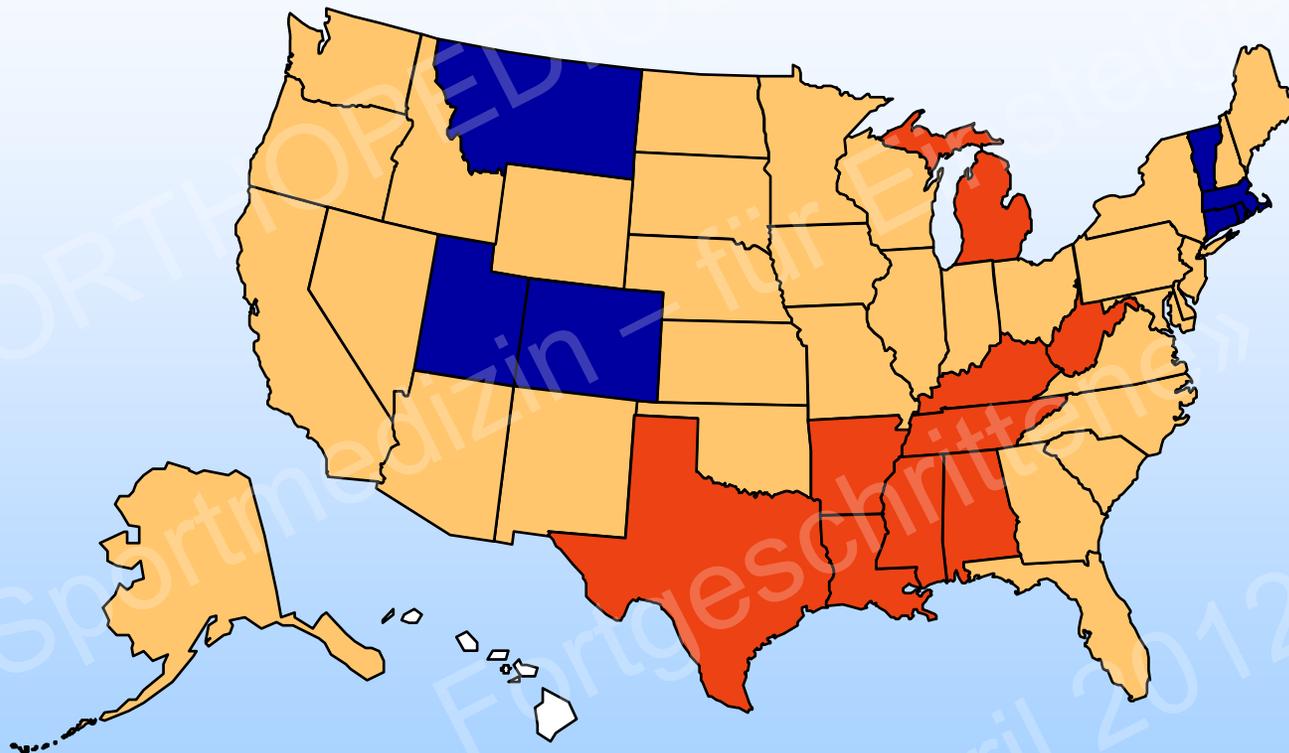
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2004

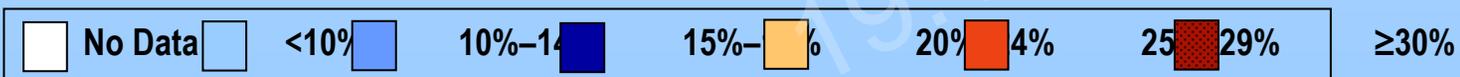
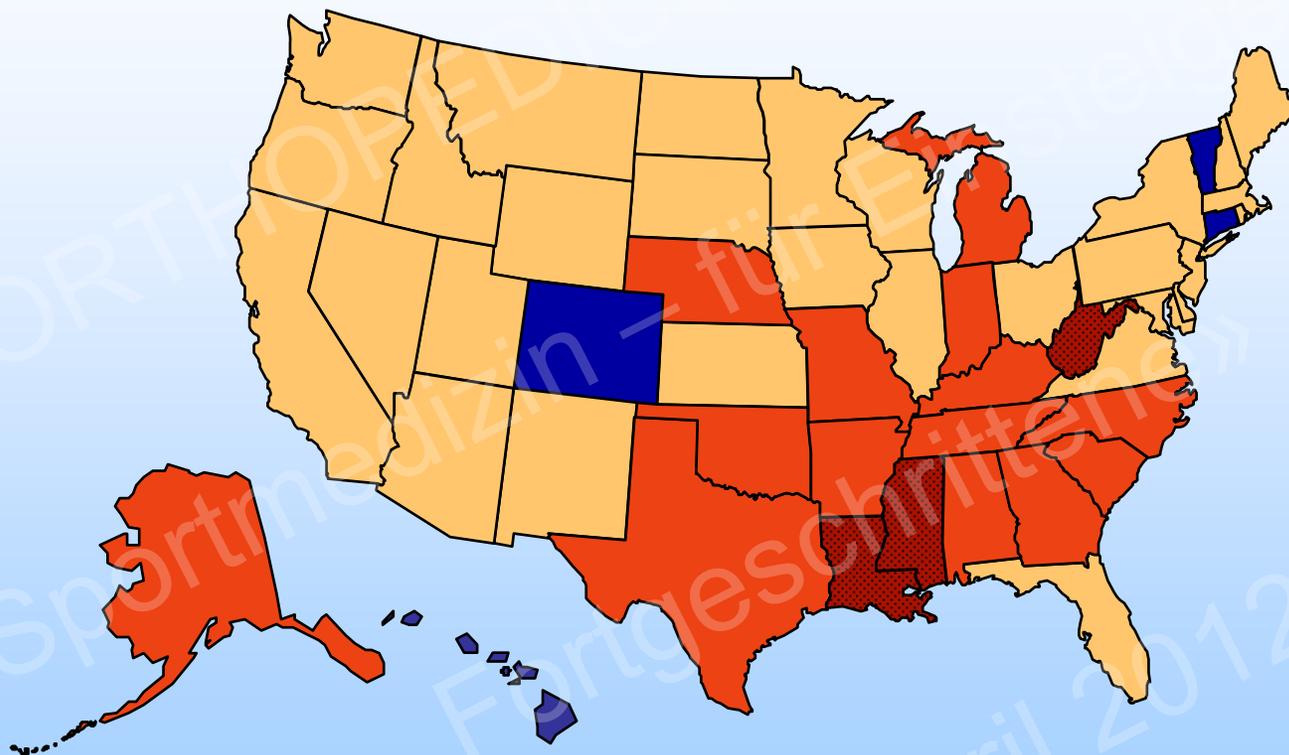
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2005

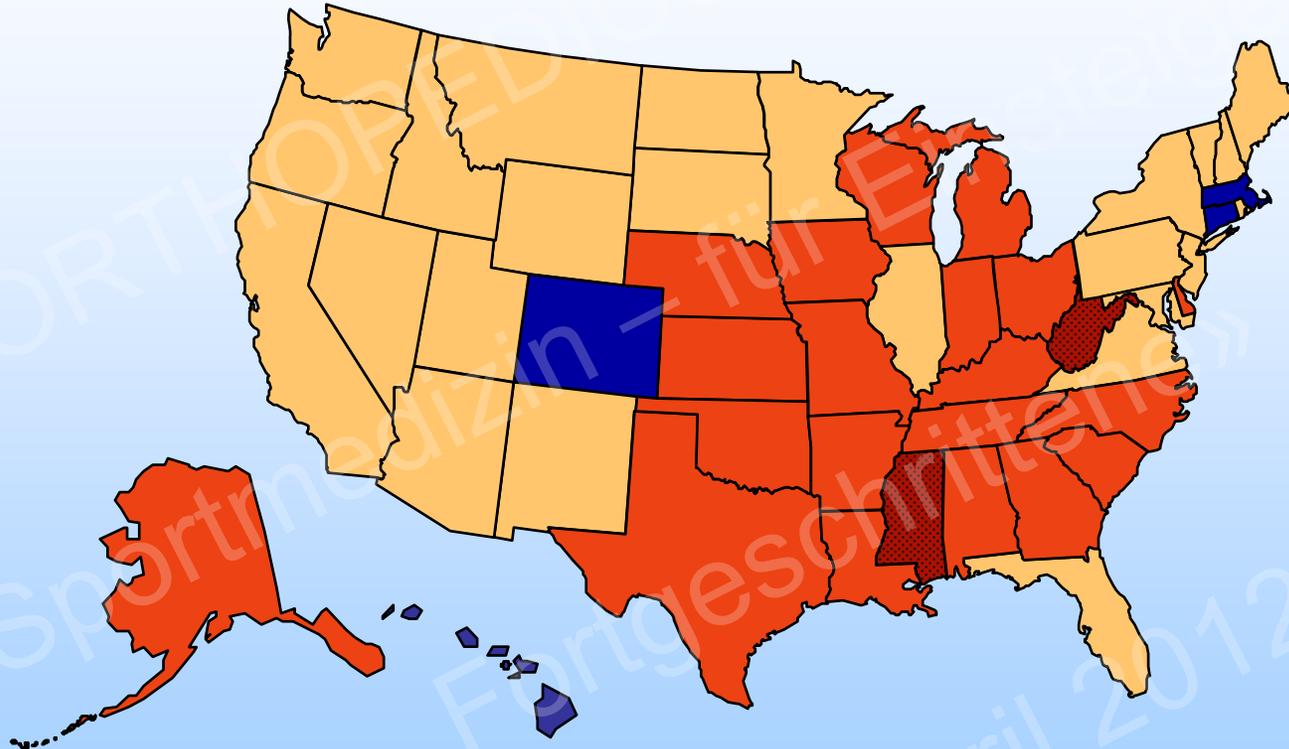
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2006

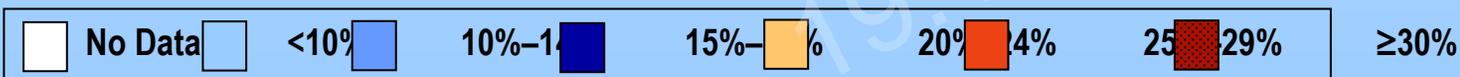
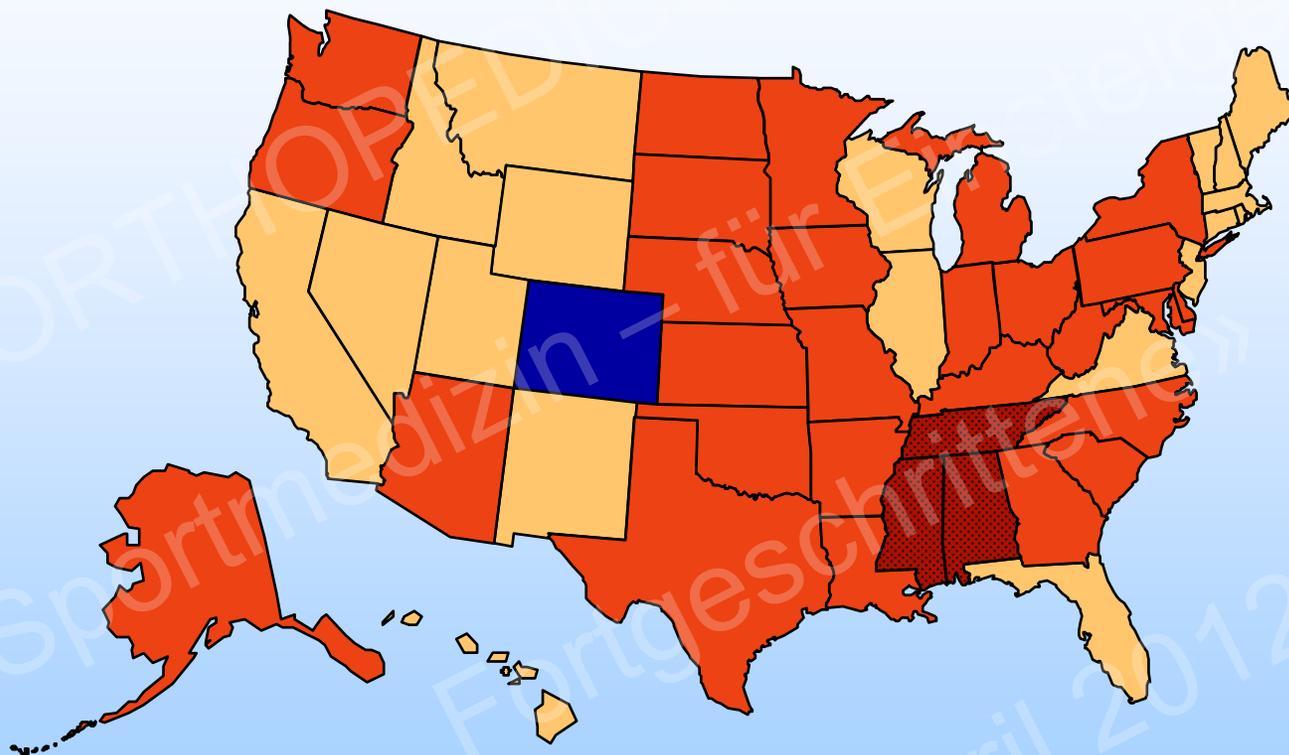
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2007

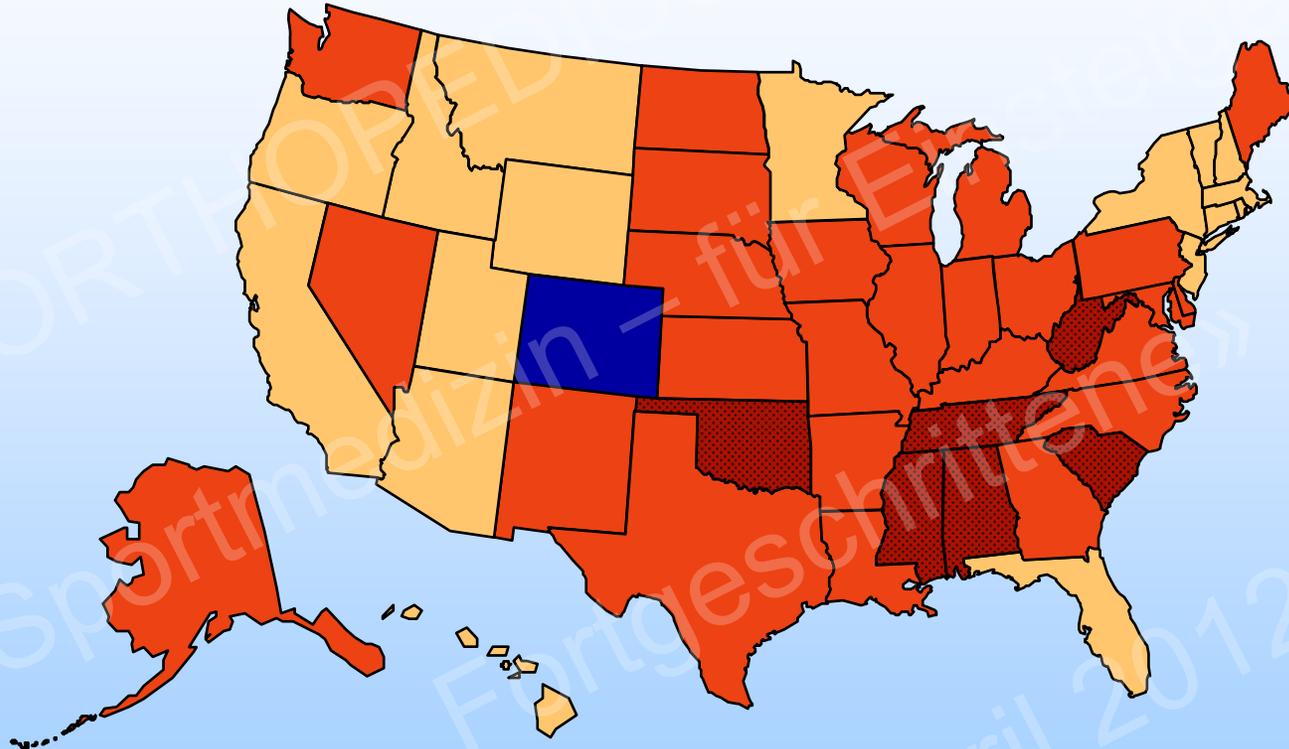
(*BMI ≥30, or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2008

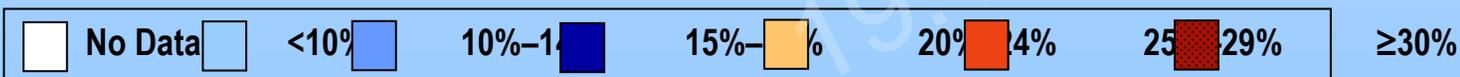
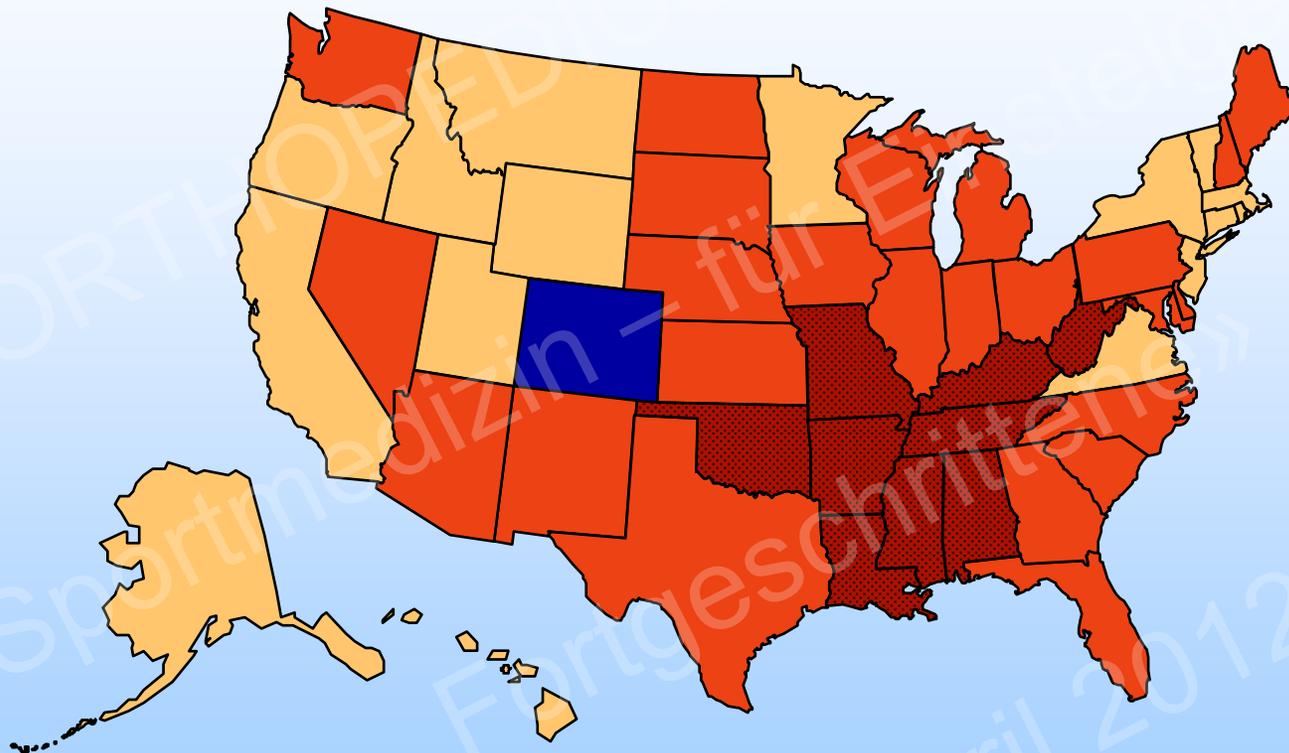
(*BMI ≥30, or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

BRFSS, 2009

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)





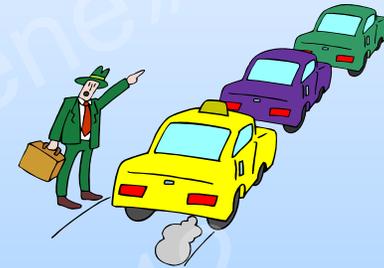
Entwicklung der Fettleibigkeit

korreliert mit:

~~- Nahrungsangebot~~



- Anzahl Auto pro Einwohner

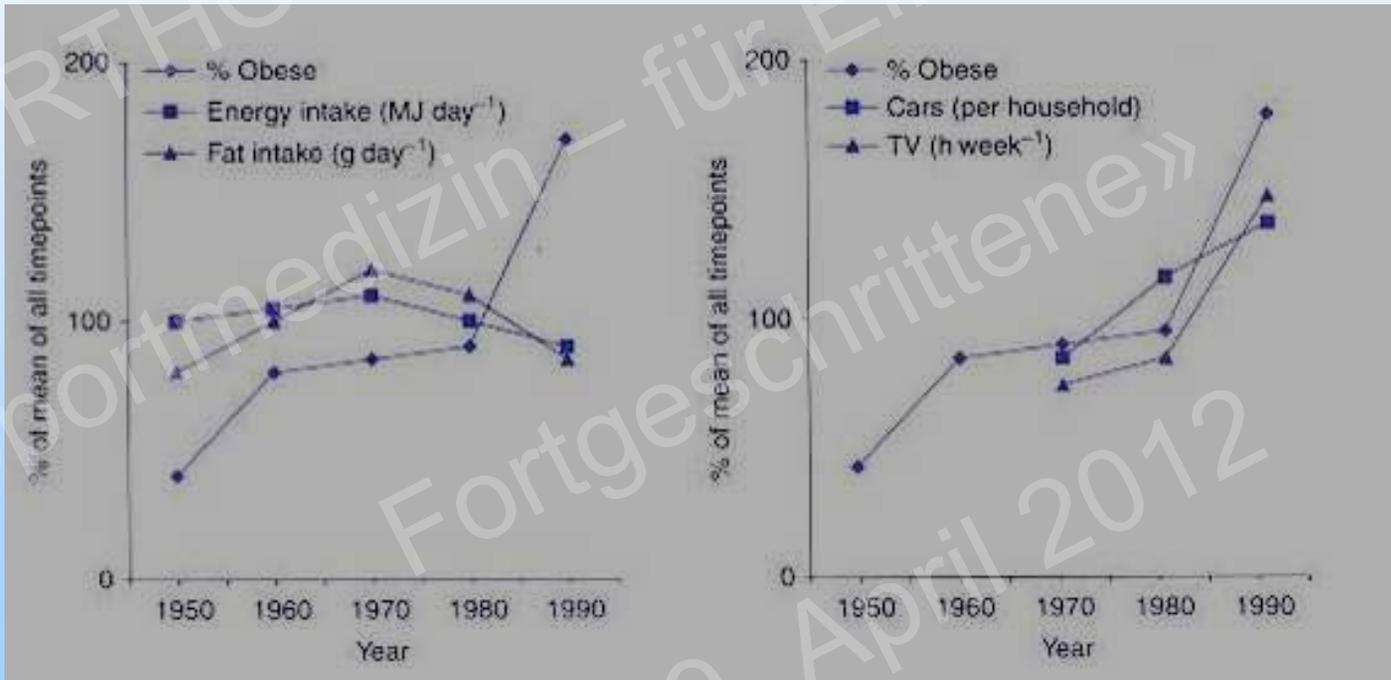


- Anzahl TV-Stunden pro Tag





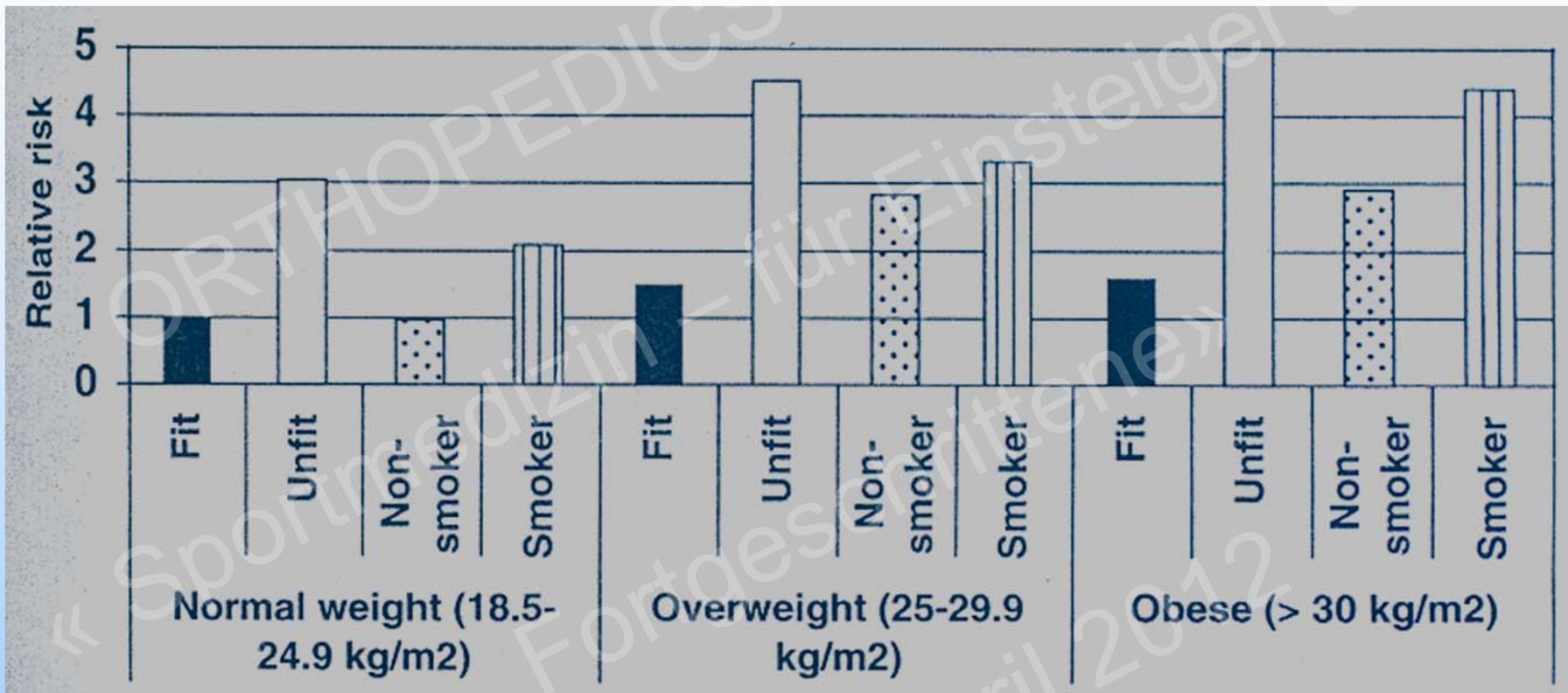
Entwicklung der Fettleibigkeit in Relation zur Nahrungsmenge Motorisierung/ TV-Stunden



M Prentice + Susan A Jebb; 95 BMJ 311: 437-9



Überleben des Aktivsten



M Wei ; et al JAMA 282: 1547-1553, 1999

19. April 2012

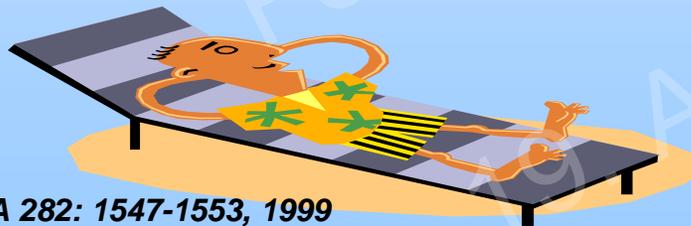


Überleben des Aktivsten

Better fat and fit



then slim and sendentary !



M Wei ; et al JAMA 282: 1547-1553, 1999

Dr.med. W.O. Frey



Körperliche Aktivität und Artherosklerose

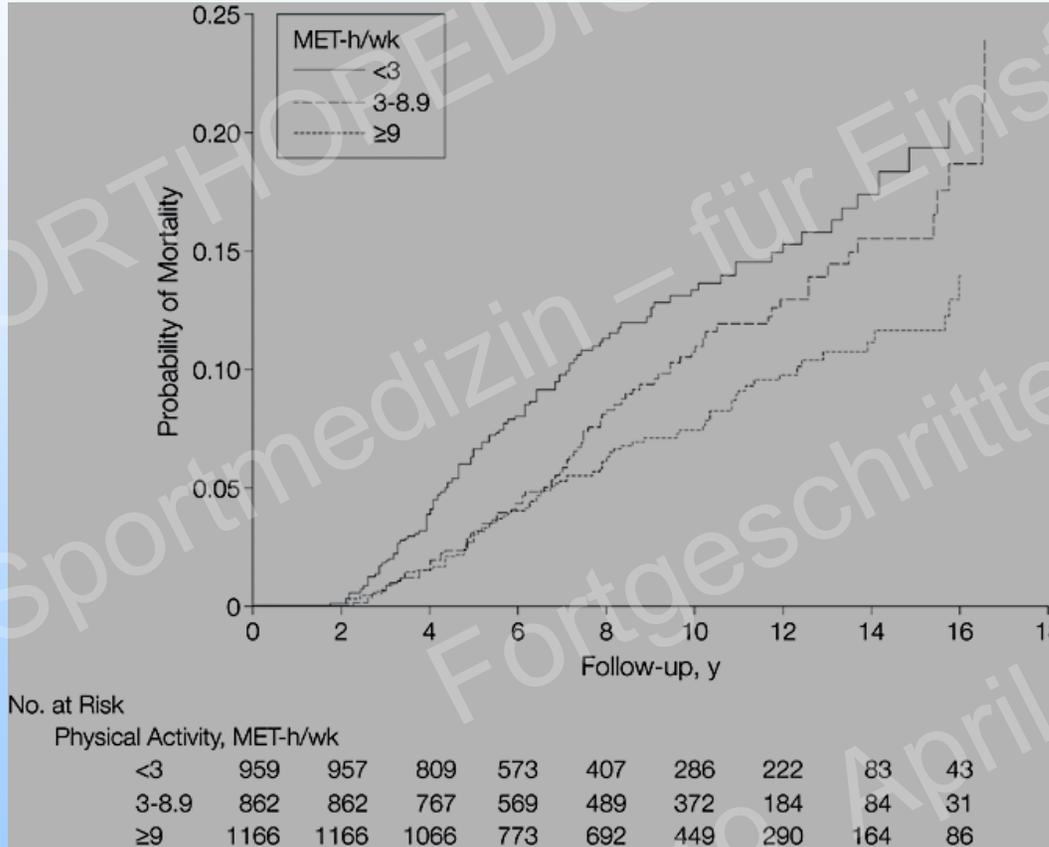


- **1500 kcal/ Woche** Verlangsamung des artherosklerotischen Prozesses
- **2200 kcal/ Woche** Regression der Intima/Media Verdichtung

Hambrecht R. et al 1993; J.Am.Coll.Cardiol.22: 468-477



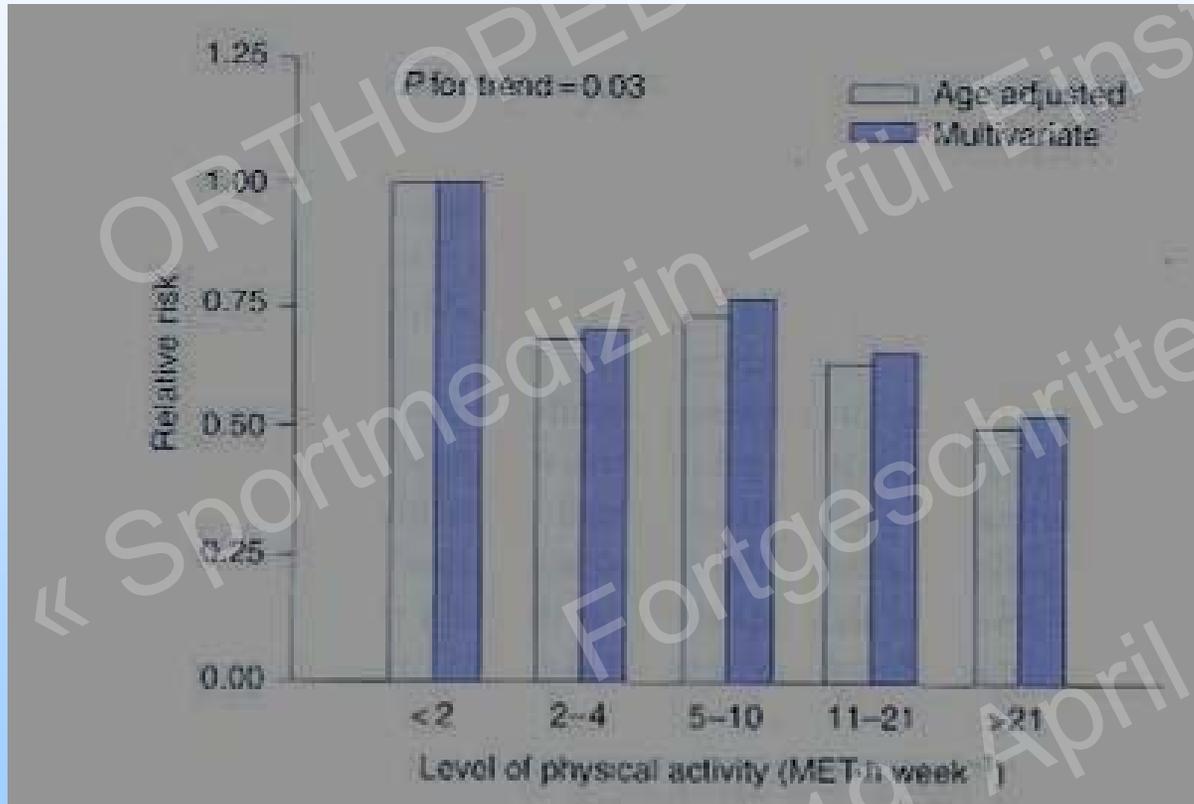
Körperliche Aktivität und Brustkrebs



Holmes, M. D. et al. JAMA 2005;293:2479-2486



Körperliche Aktivität und Coloncancerinom



ME Martinez et al., (1997), Physical Activity and Health



Risikofaktoren für den Herztod

Risikofaktoren:

- Hoher Blutdruck
- Erhöhtes Cholesterin
- Fehlernährung
- Übergewicht
- Zuckerkrankheit
- Stress
- Rauchen

Inaktivität



Die körperliche Inaktivität ist einer der Risikofaktoren für den frühen Herztod. Durch Bewegung werden alle andern Risikofaktoren (ausser dem Rauchen) positiv beeinflusst. Durch diese **Schlüsselfunktion** wird die Bewegung zum wichtigsten Baustein der Prävention unserer Gesundheit.



Eine Woche ohne Bewegung

kostet  **das Gesundheitswesen gleichviel**

wie das  **Rauchen 1 Zigarettenpaketes**

Khan K.M. bjsm May 2010



Sport ist ...

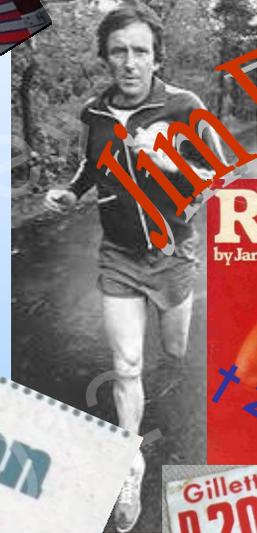




Der Tod läuft mit!



Tote am Marathon
MARATHON - Am vergangenen Sonntag starben zwei Läufer am New-York-Marathon nach der Zielankunft an einem Herzinfarkt.
11.2008



Jim Fixx

The Complete Book of Running
by James E. Fixx

+ 20.07.1984

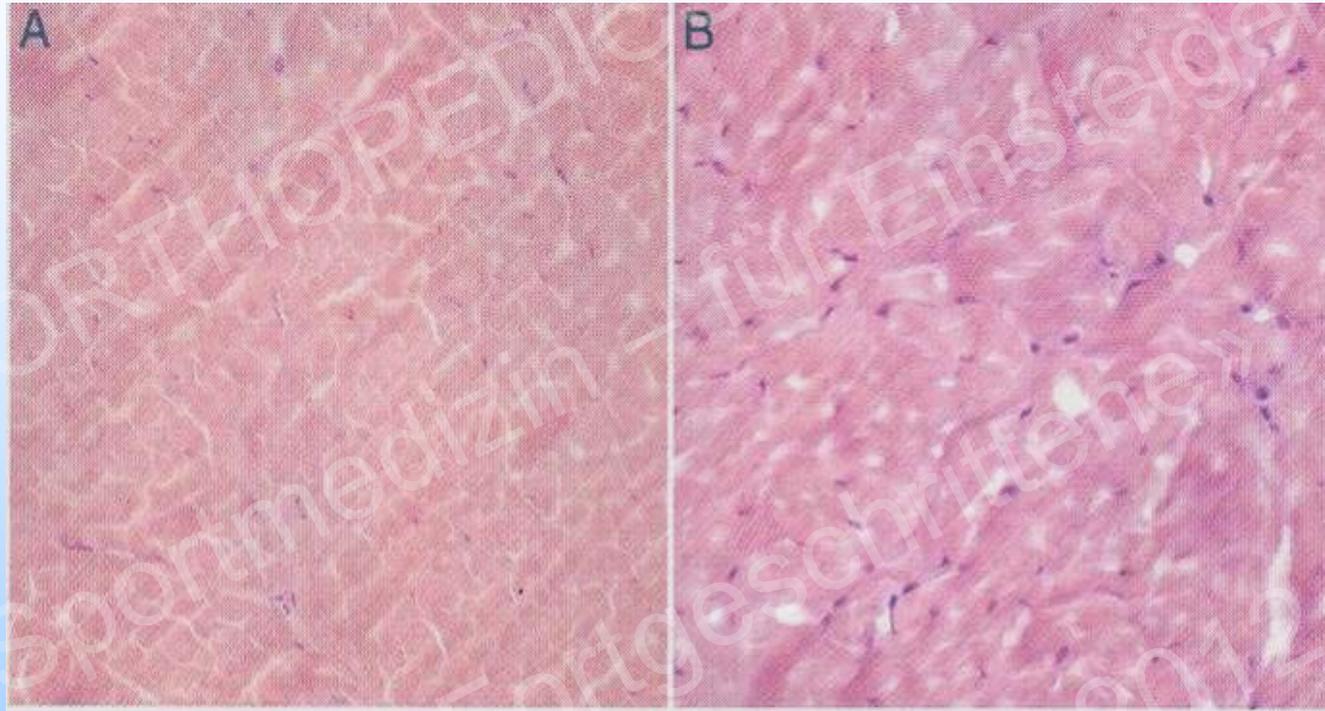




**wie alt sind
diese Hände ??**



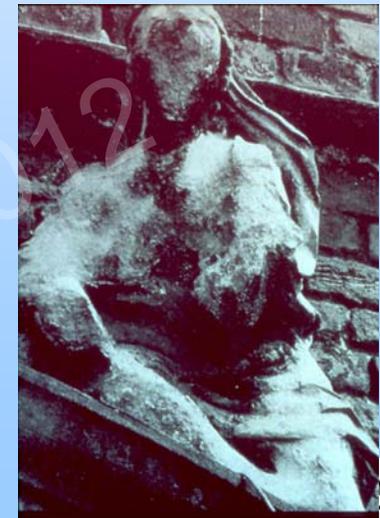
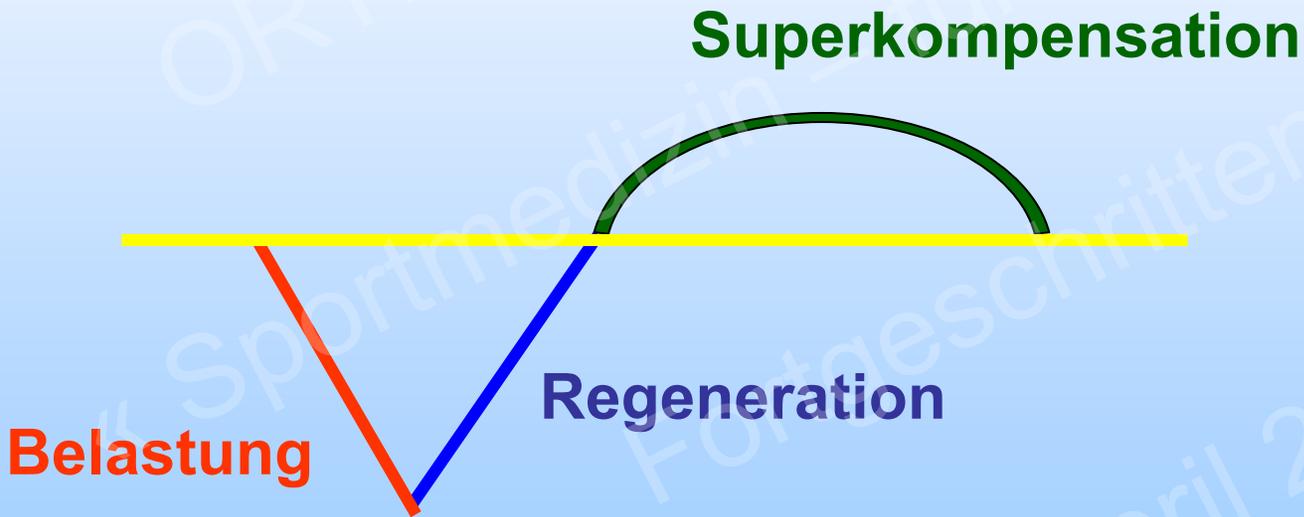
Sport ist Zerstörung



Br J Sports Med 2011, Gustav Andersson, 45:399-406, Fig. 5

19. April 2014

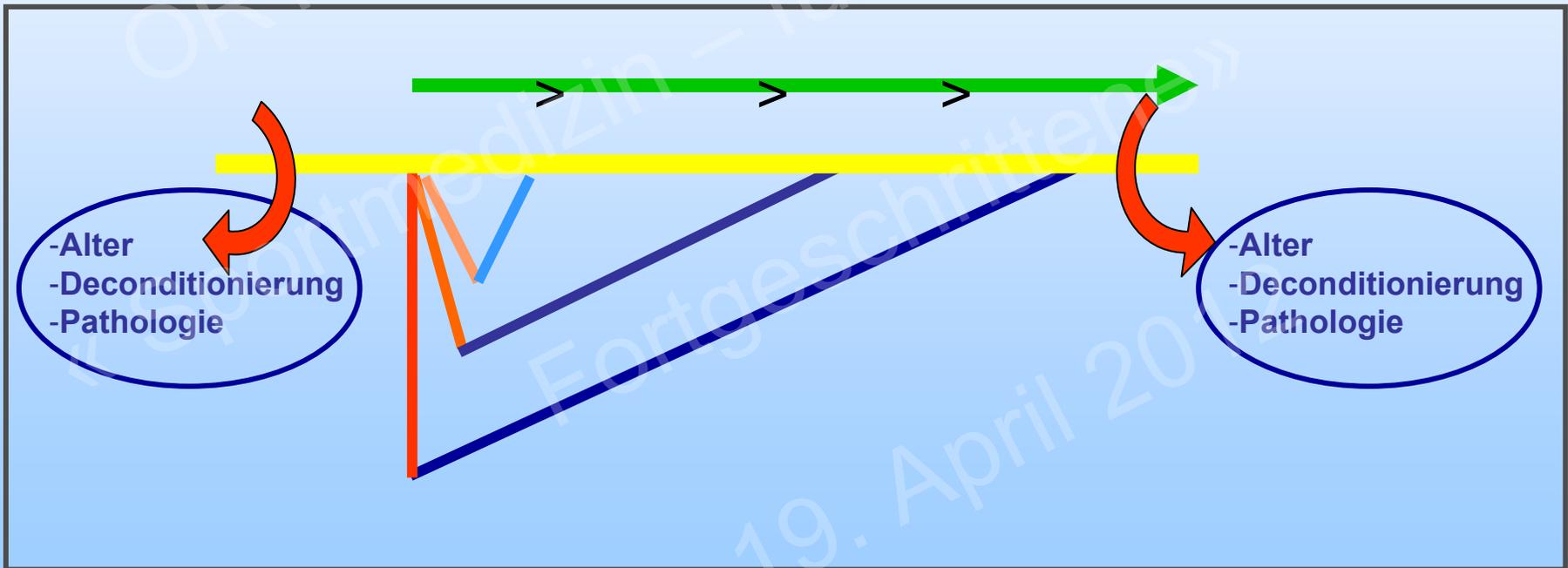
Was beinhaltet Bewegung?





Sinnvoll belasten – Optimal regenerieren

Eine grössere Belastung, als auch eine verlangsamte Regeneration werden durch die gleichen Cofaktoren verstärkt und rufen damit einen entsprechend verlängerten Effekt auf der Zeitachse aus





AMERICAN COLLEGE
of SPORTS MEDICINE

Nebenwirkungen

Your Prescription for Health

Exercise
is Medicine™

www.ExerciseIsMedicine.org



Tod beim Marathonlauf

Teilnehmer (Halb-) Marathon USA

2000 1 Mio Teilnehmer
2010 2 Mio Teilnehmer

Race Associated Cardiac Arrest Event Registry (RACER)

10,9 Mio Läufer

† 1,00 / 100'000 Marathon

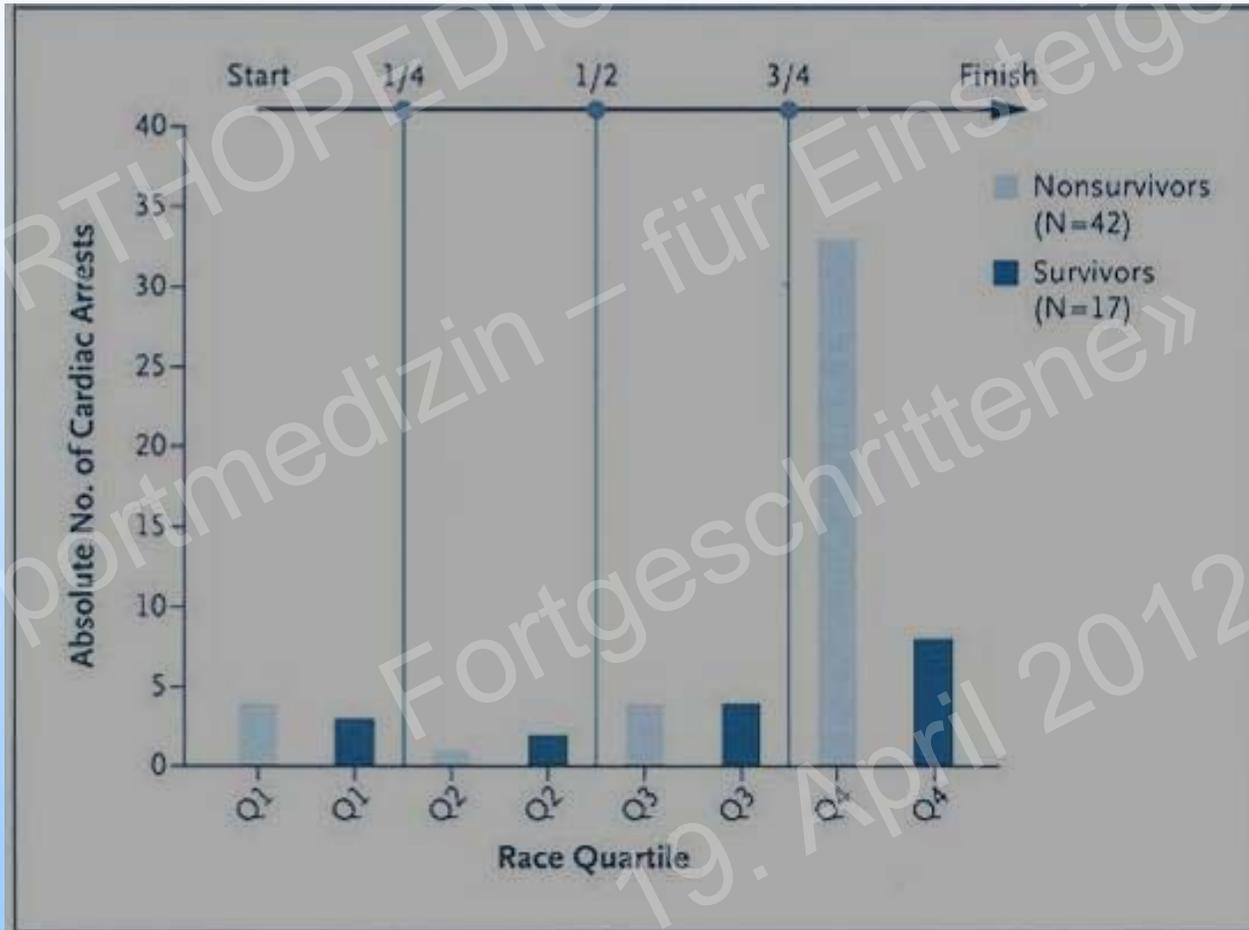
† 0,27 / 100'000 1/2 Marathon



Kim J.H. et al, 2012: NEJM (366) 130-140



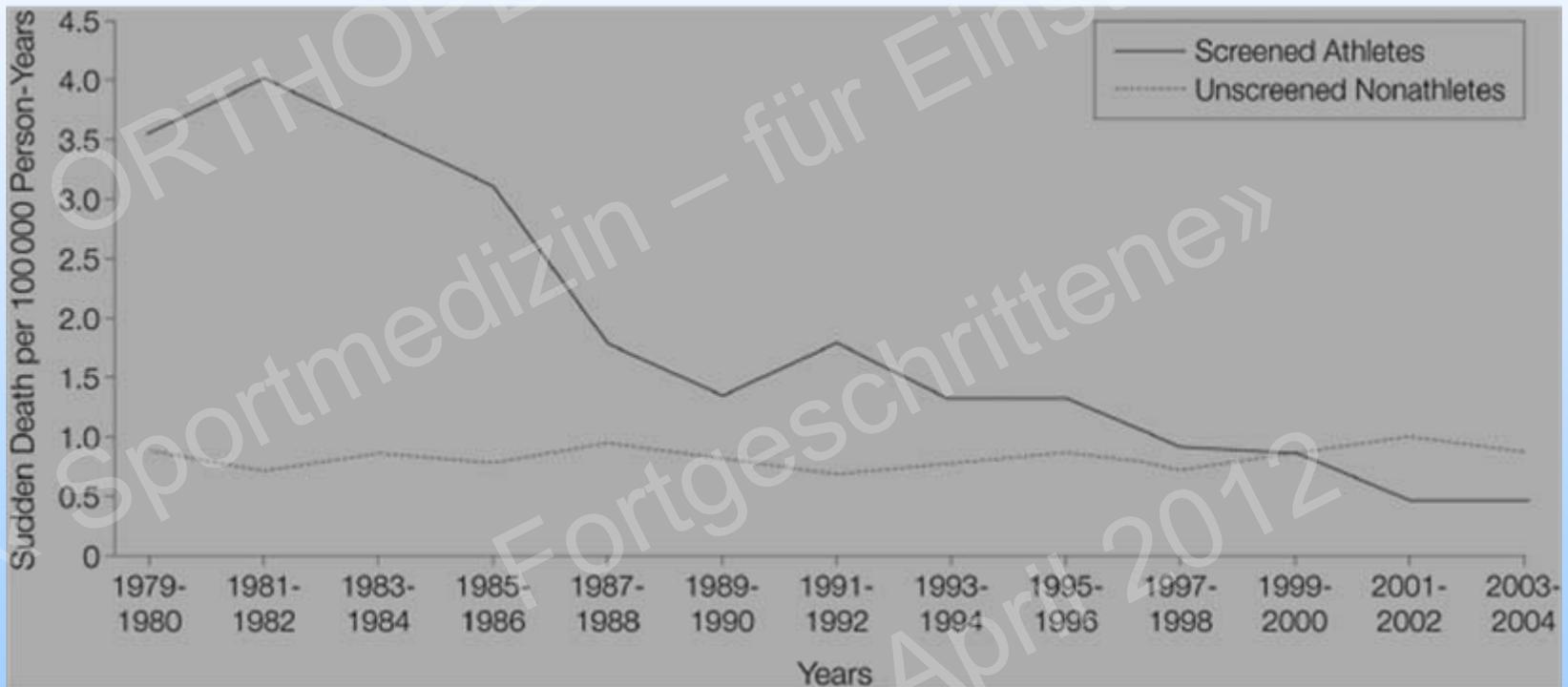
Tod beim Marathonlauf Ort des Ereignisses



Kim J.H. et al, 2012: NEJM (366) 130-140



Plötzlicher Herztod Region Veneto 1979-2004



Corrado et al, 2006 JAMA 296: 1593-1601



Gefä



halgrist
move>med



Sch

eln

19. April 2012



Schneeschaufeln



ACSM: Barry A. Franklin, Ph.D., FACSM : If exercise has medicinal properties, is overdosing possible?



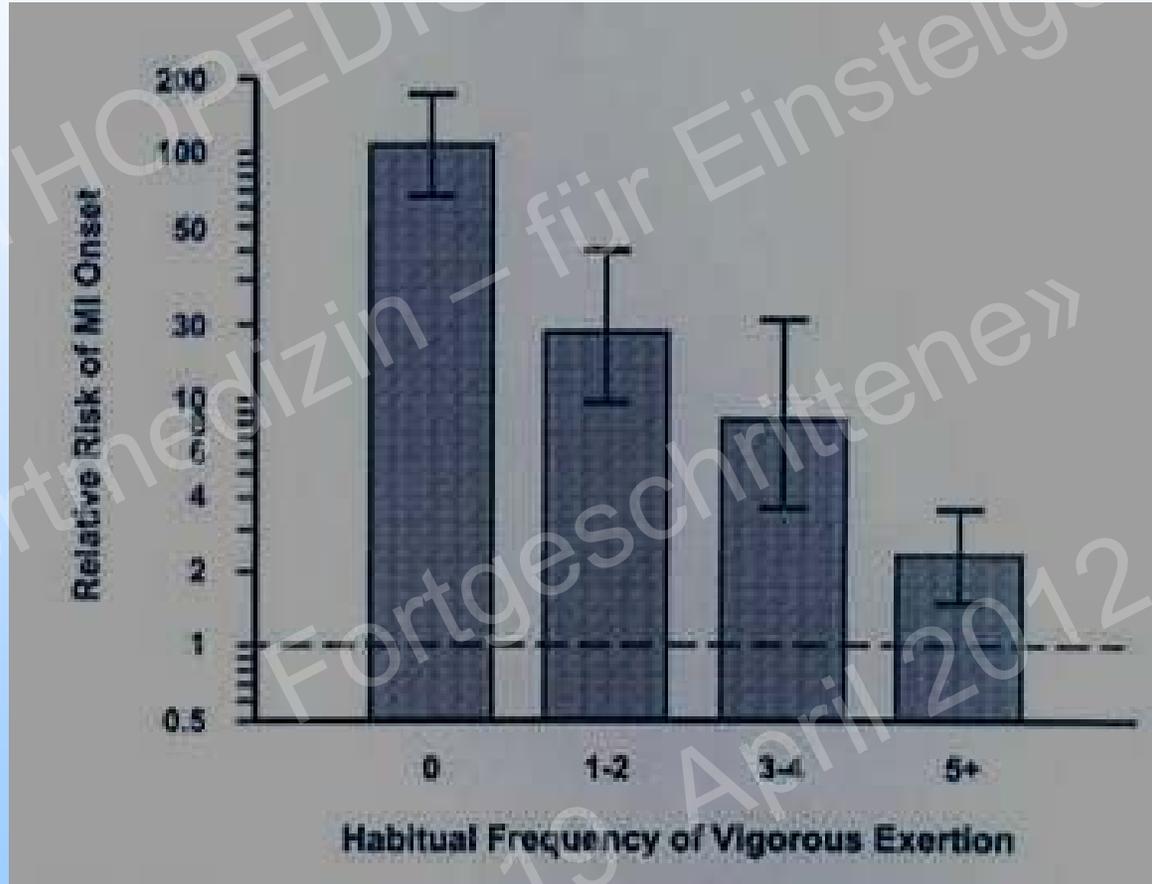
Tötet Schneeschaufeln?

Cardiorespiratory Measurements During Treadmill and Snow Shoveling (Means ± SD)

Variable	Treadmill Testing	Snow Shoveling
Heart-rate (beats/min)	179 ± 17	175 + 15
Systolic blood pressure (mm Hg)	181 ± 25	198 + 17
Rate-pressure product (mm Hg x beats/min x 10 ⁻²)	322 ± 40	342 + 34
Oxygen consumption (METs)	9.3 ± 1.8	5.7 + 0.8
Rating of perceived exertion (6-20 scale)	17.9 ± 1.5	16.7 + 1.7



Risiko eines akuten Myokardinfarktes beim Sport



AHA Scientific Statement Circulation 2007: 115; 2358-68

Körperliche Bewegung und Gesundheit





AMERICAN COLLEGE
of SPORTS MEDICINE

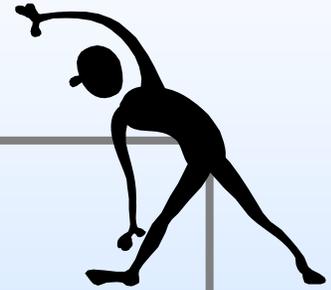
Nebenwirkungen

Rezeptpflichtig



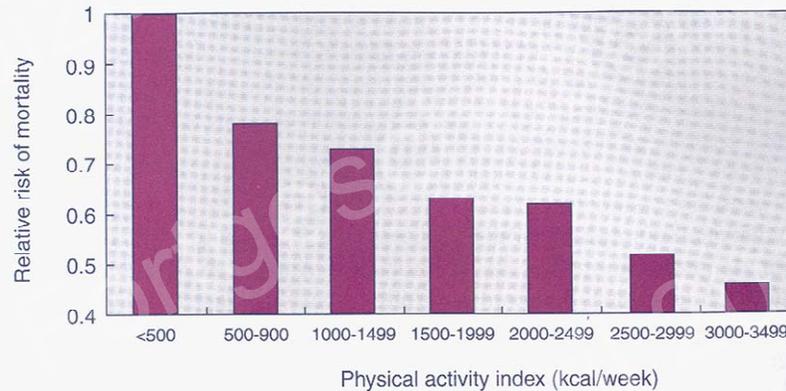
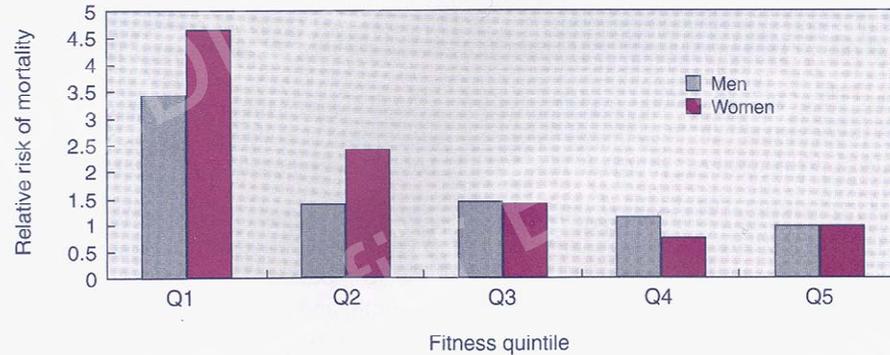


Gesundheit vs Fitness





Wie viel?



Blair, S.N., et al, Physical fitness and all-cause mortality: JAMA 262: 2395-401
Paffenbarger R.S, et al, (1986) Physical activity, NEJM 314: 605-13



Empfehlung

60 Minuten pro Tag

an den meisten Tagen
der Woche

leicht / moderat

am Stück oder addiert

10'000 Schritte täglich !





Gesundheit vs Fitness



 **Fitness**

**go hard
or
go home**





Faktoren der Fitness

Beweglichkeit



Kraft



Ausdauer



Koordination

Schnelligkeit

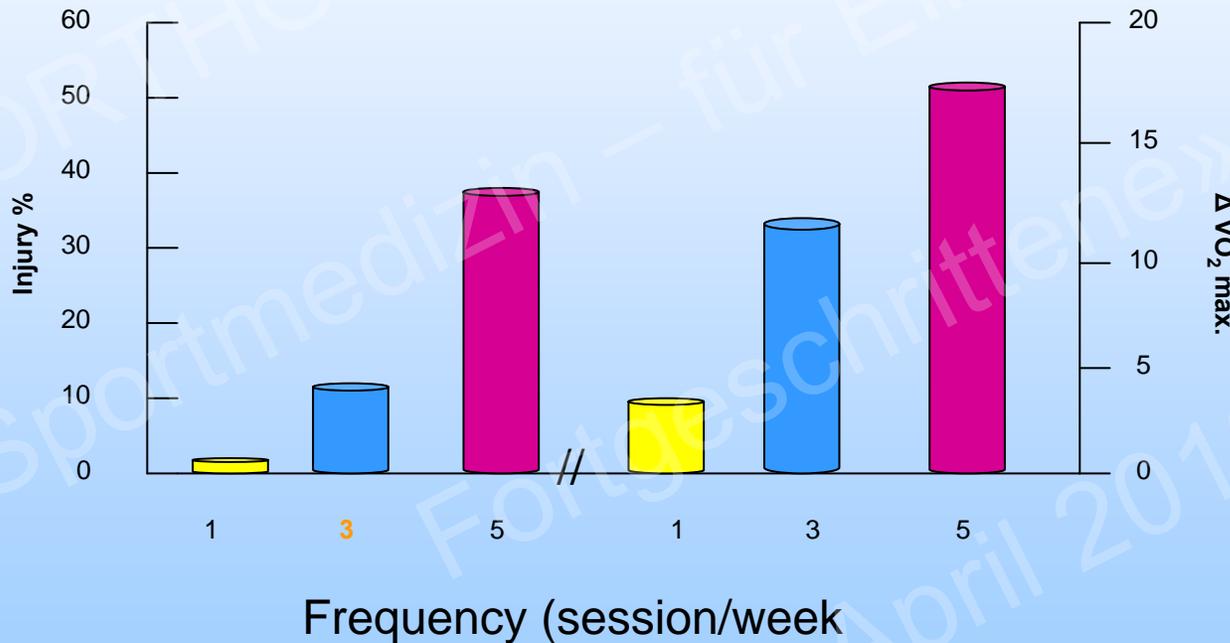


Rezept

- F** Frequency
- I** Intensity
- T** Duration
- T** Type



Bewegung



F
I
T
T

Adapted from Pollok ML et al.; Med Sci Sports 1977;9:31-36



Empfehlung Fitness

Intensität: Faustregel

Herzschlag: $170 - \frac{1}{2}$ Alter (über 40 jährig)

Herzschlag: $180 -$ Alter (unter 40 jährig)

Borg Skala: Wahrgenommene Anstrengung (6-20): 9-12

Möglichkeit ohne Unterbrechung **5 Wörter** zu sprechen

F

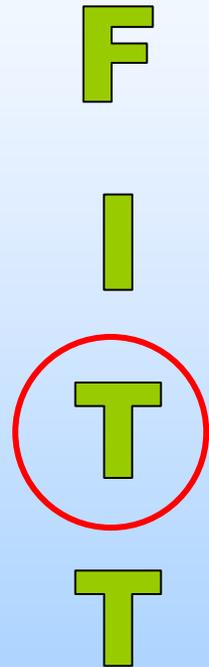
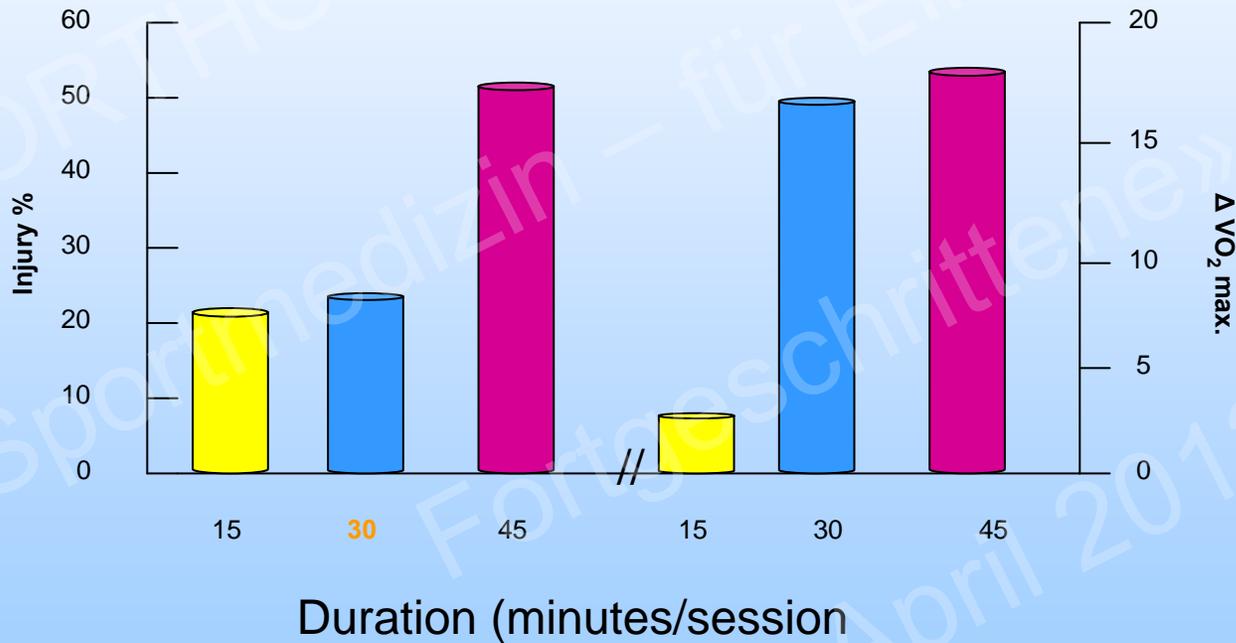
I

T

T



Bewegung



Adapted from Pollok ML et al.; Med Sci Sports 1977;9:31-36



Wann kommt die Fitnesspille?

AMPK and PPAR δ Agonists Are Exercise Mimetics



Vihang A. Narkar¹, Michael Downes¹, Ruth T. Yu¹, Emi Embler¹, Yong-Xu Wang⁴, Ester Banayo³, Maria M. Mihaylova², Michael C. Nelson¹, Yuhua Zou¹, Henry Juguilon¹, Heonjoong Kang⁵, Reuben J. Shaw² and Ronald M. Evans^{1, 3},

CLINICAL IMPLICATIONS OF BASIC RESEARCH

The Exercise Pill — Too Good to Be True?

Laurie J. Goodyear, Ph.D.

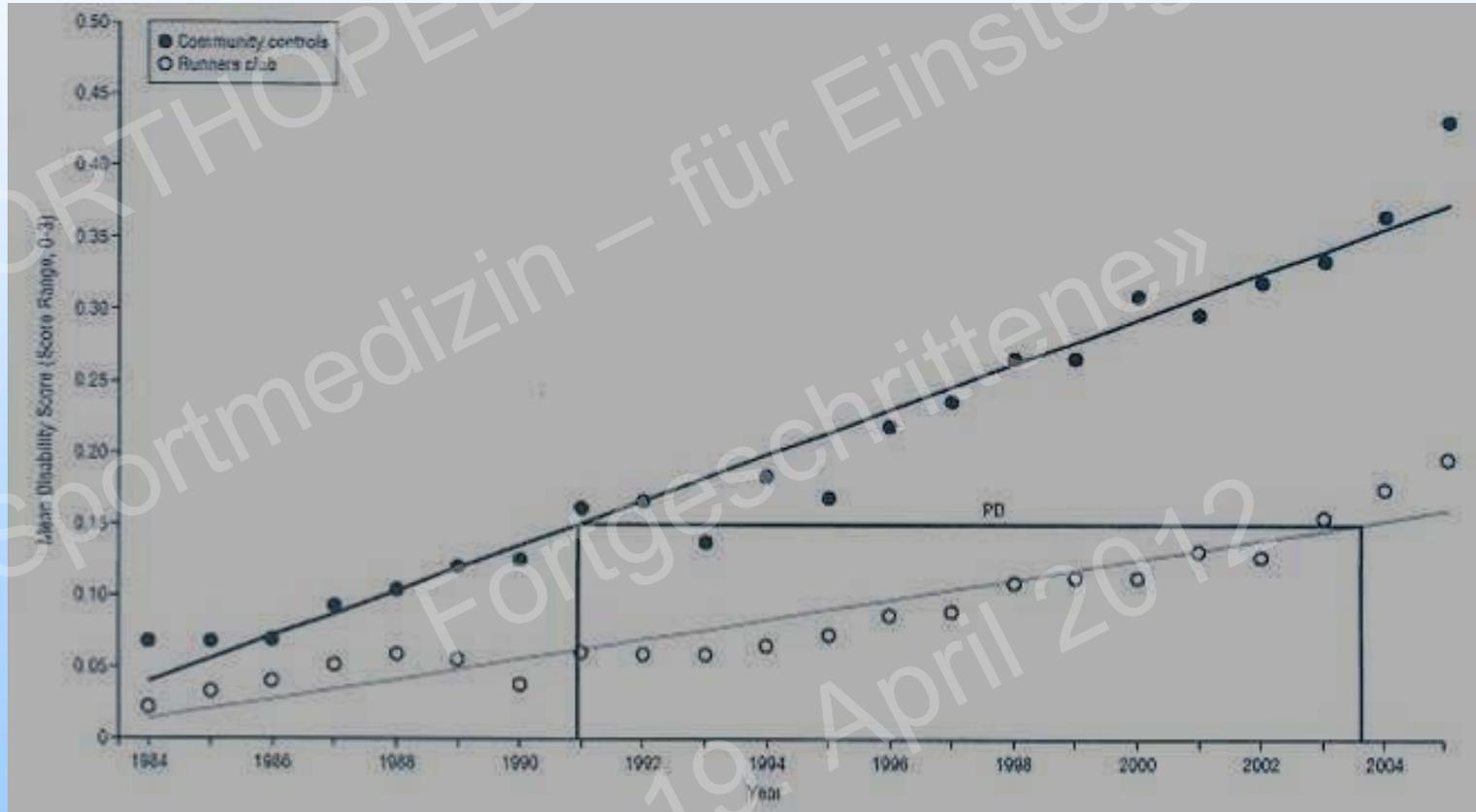
N Engl J Med 2008; 359:1842-1844 | October 23, 2008



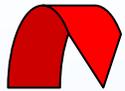
Cell 2008: Vihang A. Narkar et al, 134: 405-415, August 8, 2008



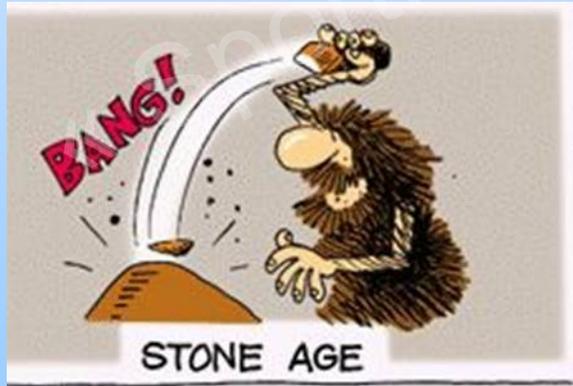
Gesundheit – Lebenslang körperlich Aktiv



Eliza F. Chakravarty et al, Arch Intern Med. 2008; 168(15): 1638-1646

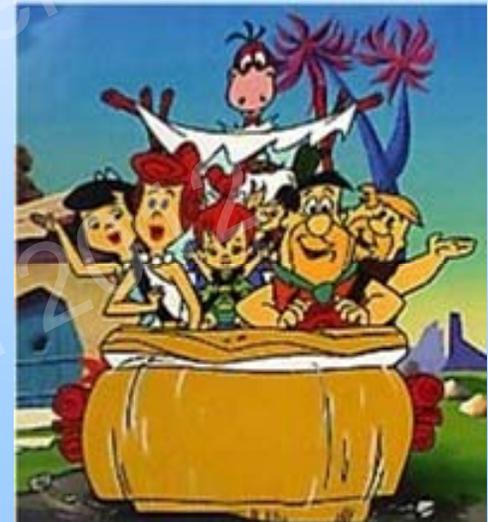


Fortschritt





Wir alle sind Mikes !



Dr.med. W.O. Frey

Ausdauer Aktivitäts Menueplan

Gesundheit

Bewegung

60 Minuten
täglich



Dr.med. W.O. Frey

Fitness

Sport

3-4x/Woche 45-90 Min.
2/3 Moderat (5 Wörter)

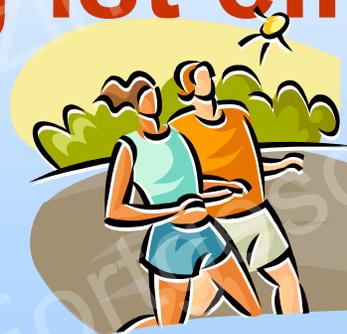
Ausdauer, Kraft
Beweglichkeit
Koordination





Sport ist nicht Mord

Bewegung ist ein Medikament

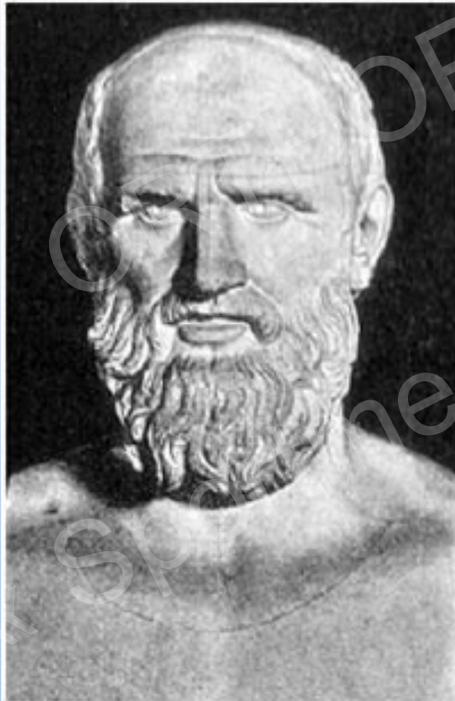


**mit Wirkungen und (tödlichen)
Nebenwirkungen**





„Walking is man's best medicine“



Hippokrates
460 v. Chr.

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Vielen Dank



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We are as young as our ensuing years

