Diyabetik hastalarda egzersiz

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Endokrinoloji Metabolizma ve Diyabet Bilim Dalı

Hekim olarak diabetik hastalarda egzersiz önerirken ne yapıyorsunuz ?

a. Egzersiz önerecek zamanım yok sadece ilaçlarını düzenliyorum
b. Egzersiz yapmamasını öneriyorum
c. Sadece yürü diyorum
d. Yürümekten fazla (süre ve şiddet olarak) egzersiz yapabileceğini söylüyorum

Bir diyabetik hastanız, ben maraton koşacağım derse ne yaparsınız ?

a. Sakın koşma, sen en fazla yürüyebilirsin derim
b. Koş ama maraton koşma daha kısa koş derim
c. Tamam ama önce önce kardiyak inceleme yapalım derim
d. Madalya kazanmadan dönme derim

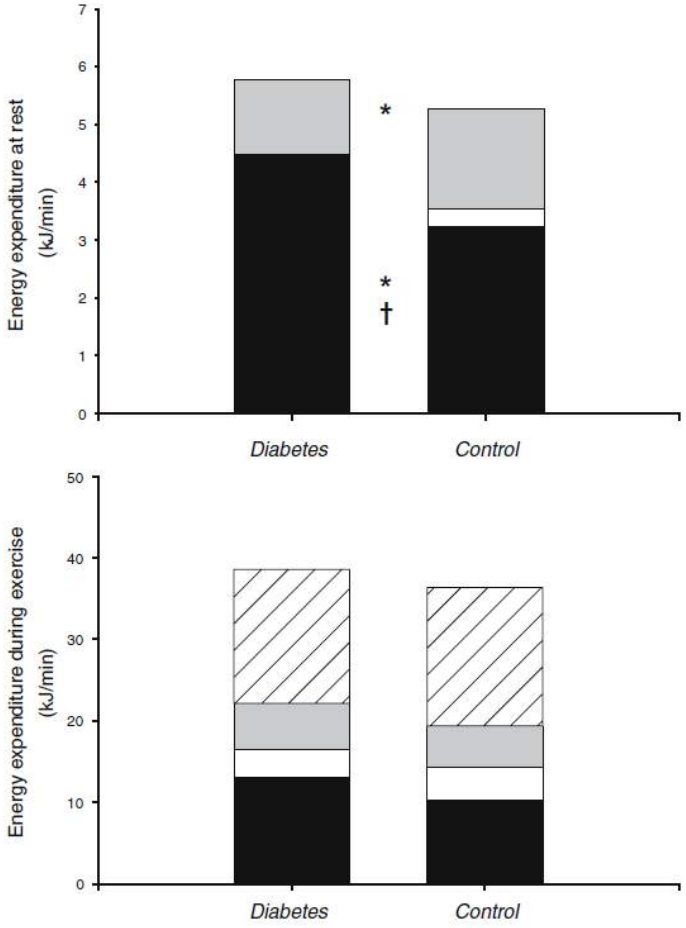
Klinisyenlerin spor önerileri konusundaki uygulamaları ne düzeydedir ?

a. Yok
b. Kötü
c. Orta
d. Yeterli

Diyabetiklerde egzersizin akut etkileri

Egzersiz ile kaslara daha fazla oranda glukoz girer. Egzersiz şiddeti arttıkça karbonhidratlara, uzunluğu arttıkça yağ asitlerine dayanan enerji metabolizması on plana çıkar.

Kategori A



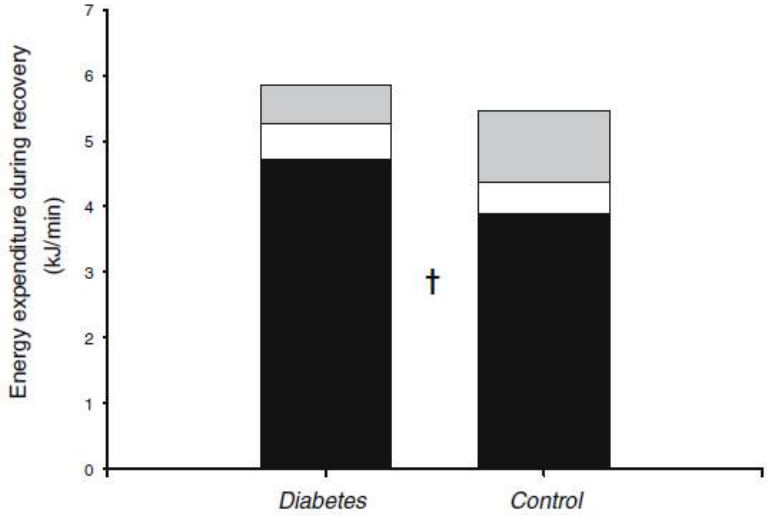


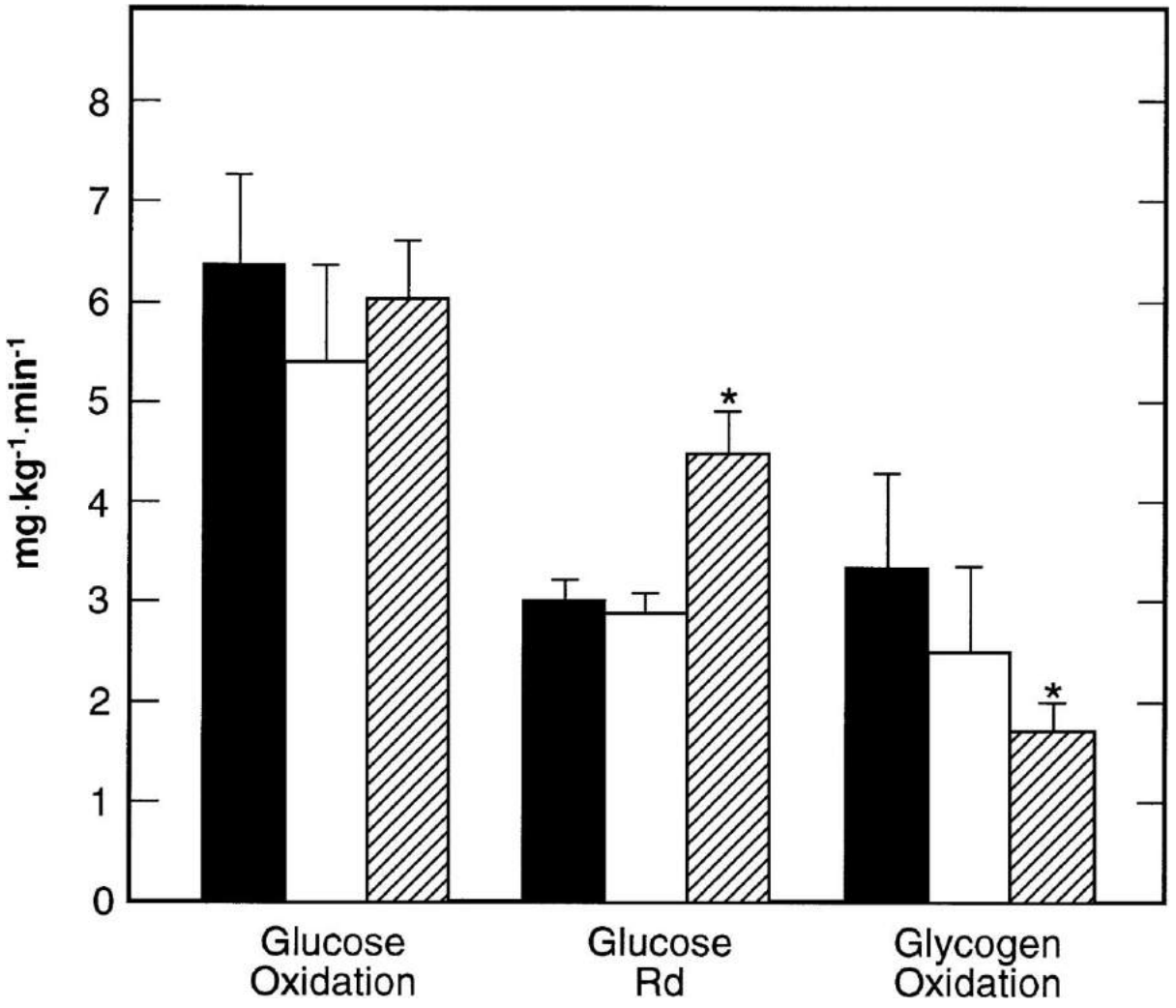
Fig. 3 Whole-body substrate source utilisation at rest (**a**) and during exercise (**b**) and post-exercise recovery (**c**). *Black* (**a–c**), plasma NEFA; *white* (**a–c**), muscle and lipoprotein-derived triacylglycerol; *grey*, carbohydrate in **a** and **c**, plasma glucose in **b**; *hatching* (**b**), muscle glycogen. *Substrate source oxidation significantly different from control group ($p<0.05$); †total fat oxidation significantly different from control group ($p<0.05$)

Kaslara glukoz girişi

Dinlenme sırasında kaslara glukoz girişi insüline bağlı yolladır ve tip 2 diyabette bozulmuştur. Egzersiz sırasında kas kasılması ile kaslara insulin yolundan bağımsız glukoz girişi olur. Bu diyabetiklerde bozulmamıştır.

Kategori A

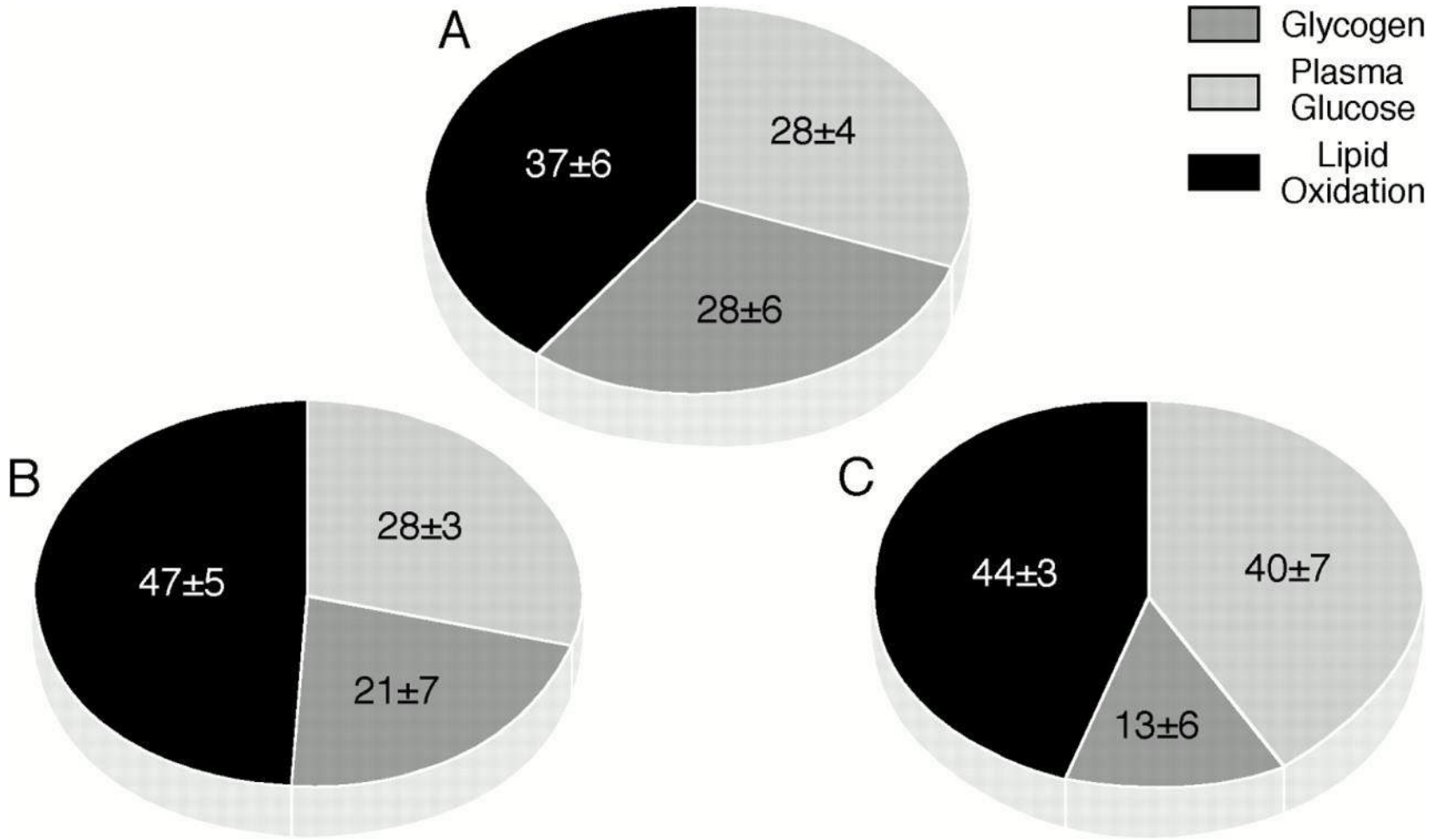
Rates of glucose oxidation, utilization of plasma glucose (glucose Rd), and glycogen oxidation during mild-intensity cycling exercise for lean nondiabetic volunteers (solid bars), obese nondiabetic volunteers (open bars), and volunteers with non-insulin-dep...



Colberg S R et al. J Appl Physiol 1996;81:2027-2033

Journal of Applied Physiology

Energy production during mild-intensity exercise.



Colberg S R et al. J Appl Physiol 1996;81:2027-2033

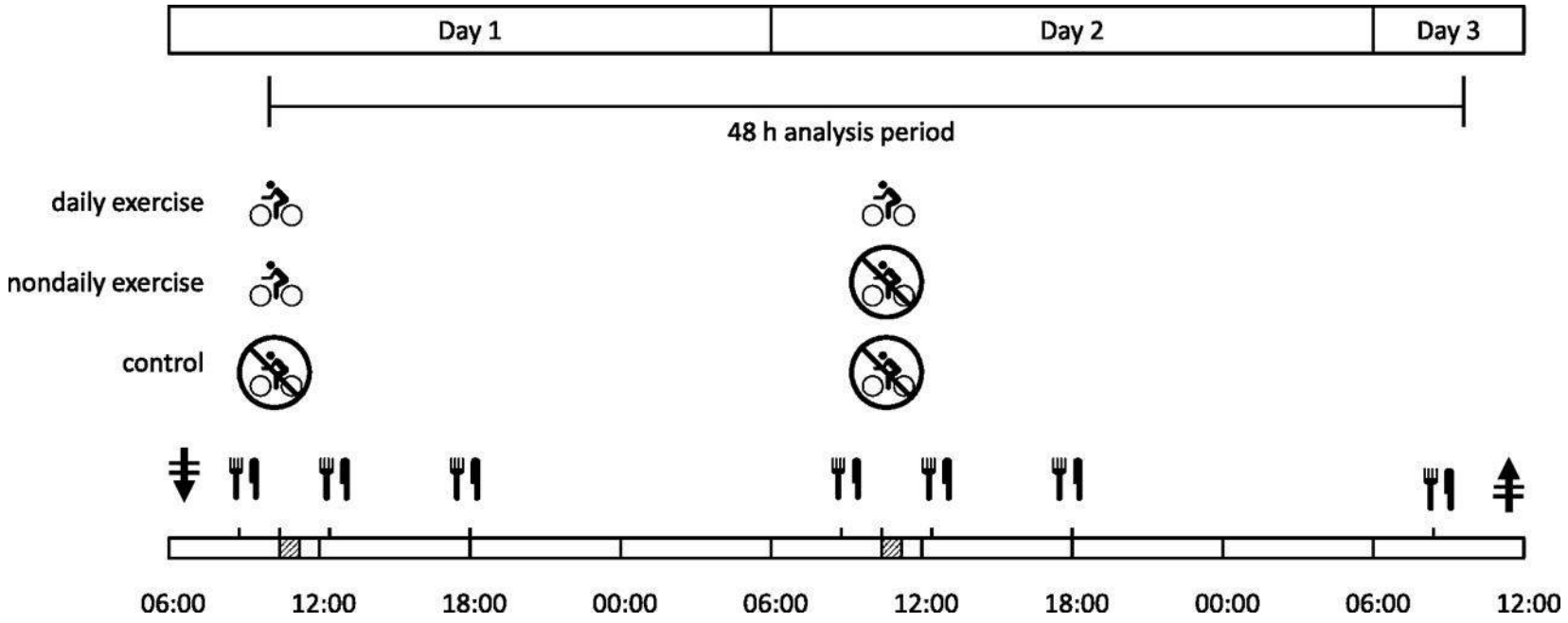
Journal of Applied Physiology

Egzersiz sonrası kan şekeri düzeyi

Egzersiz sonrası kan şekeri önemli ölçüde düşmesine rağmen insülin veya sekratogog kullanmayan hastalarda artmış hipoglisemi riski yoktur. Bir egzersizin bu etkisi 24 saatten fazla 72 saatten az sürer.

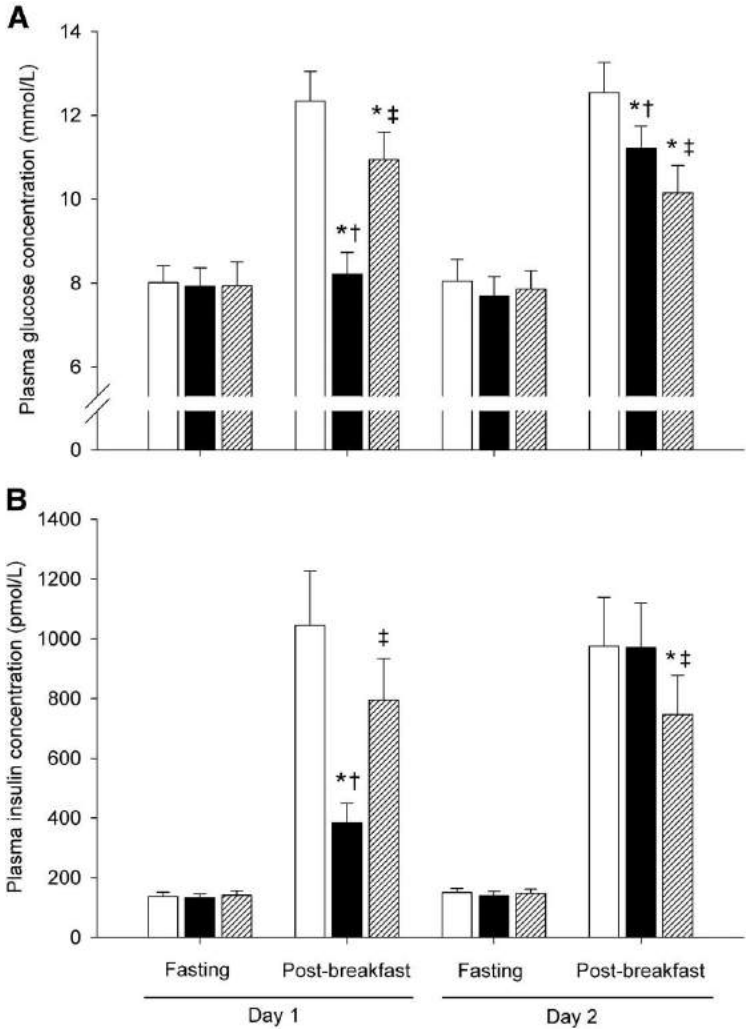
Kategori C

Schematic overview of an experimental period.



van Dijk J et al. Dia Care 2012;35:948-954

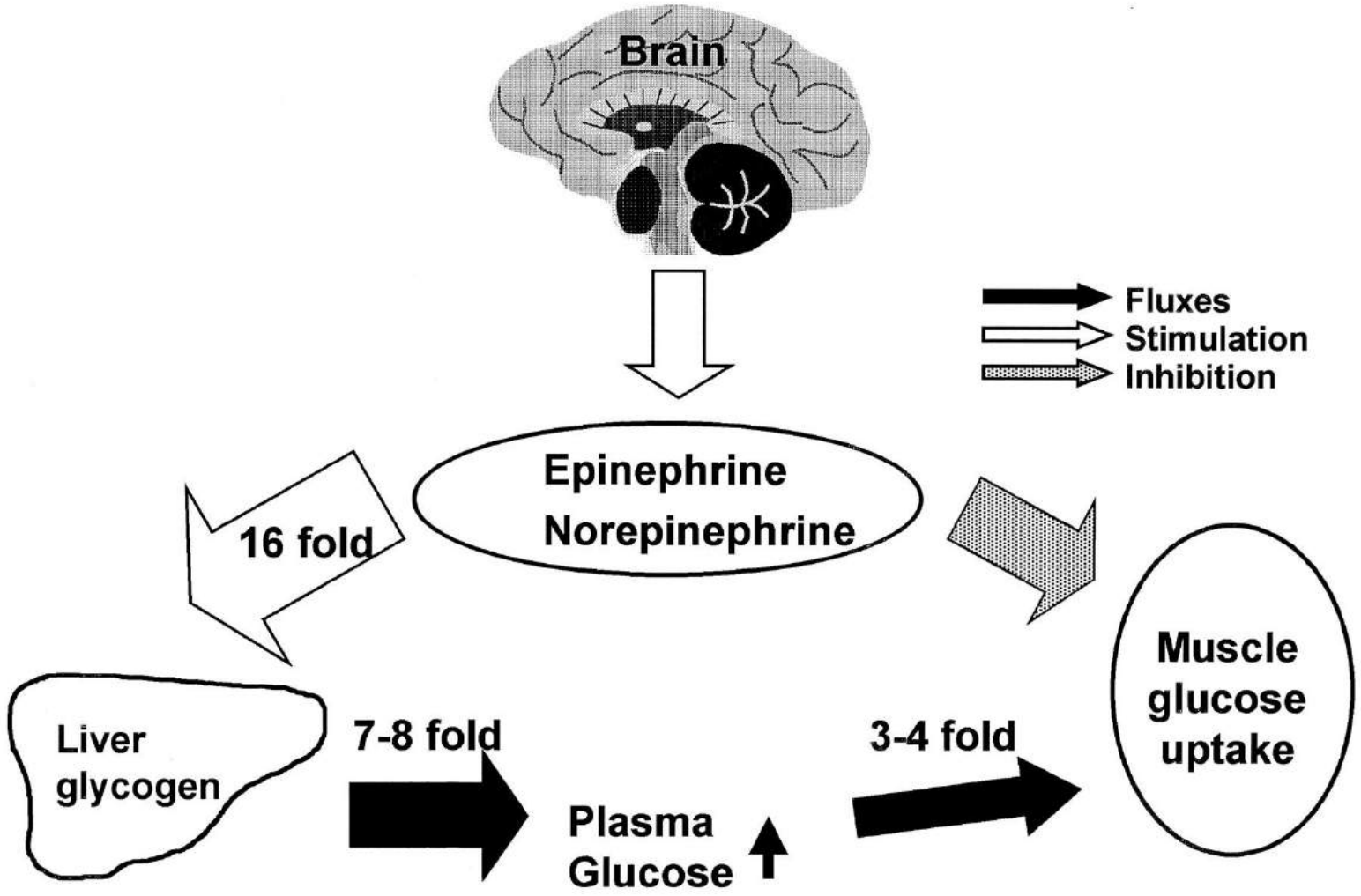
Average plasma glucose (A) and insulin (B) concentrations obtained in fasting conditions and 2.5 h following breakfast on days 1 and 2 of an experimental period during which subjects performed no exercise (control [□]) or 60 min of cycling exercise (50% Wmax) distributed either as a single session per 2 days (nondaily [■]) or as 30 min per day (daily [▨]).



van Dijk J et al. Dia Care 2012;35:948-954

Kısa süreli intensif egzersizde katekolamin artışına bağlı hiperglisemi görülebilir

Schematic representation of the current concept of glucoregulation during intense exercise (>80% Vo2max).



Marliss E B , and Vranic M Diabetes 2002;51:S271-S283

Kardiyo mu, resistans mi ?

Kombinasyon egzersizleri kan şekerini düşürmede bir tipe göre daha etkilidir

Kategori B

Annals of Internal Medicine
ESTABLISHED IN 1927 BY THE AMERICAN COLLEGE OF PHYSICIANS

From: Effects of Aerobic Training, Resistance Training, or Both on Glycemic Control
Randomized Trial

Ann Intern Med. 2007;147(6):357-369. doi:10.7326/0003-4819-147-6-200709180-00005

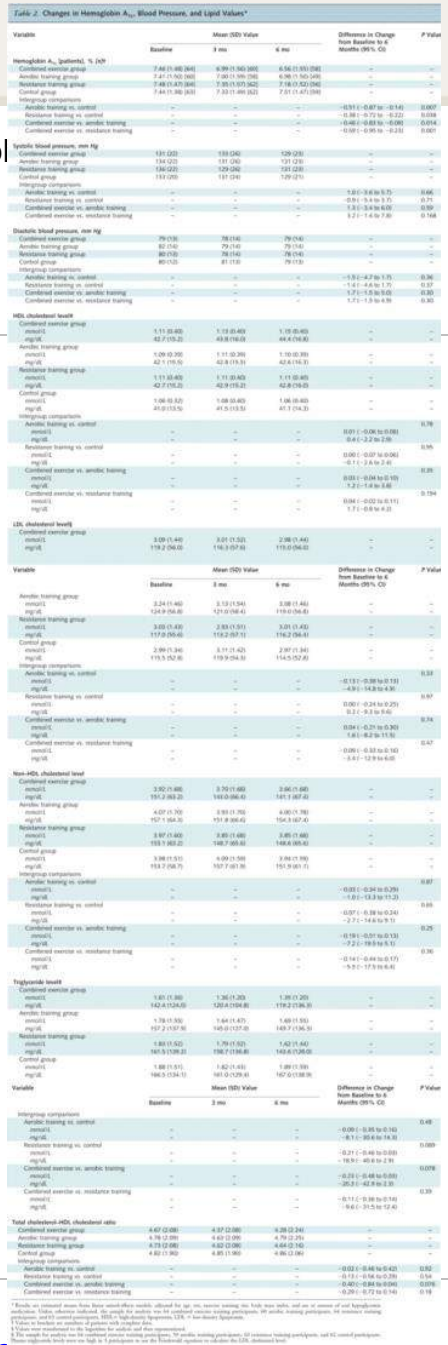


Figure Legend:

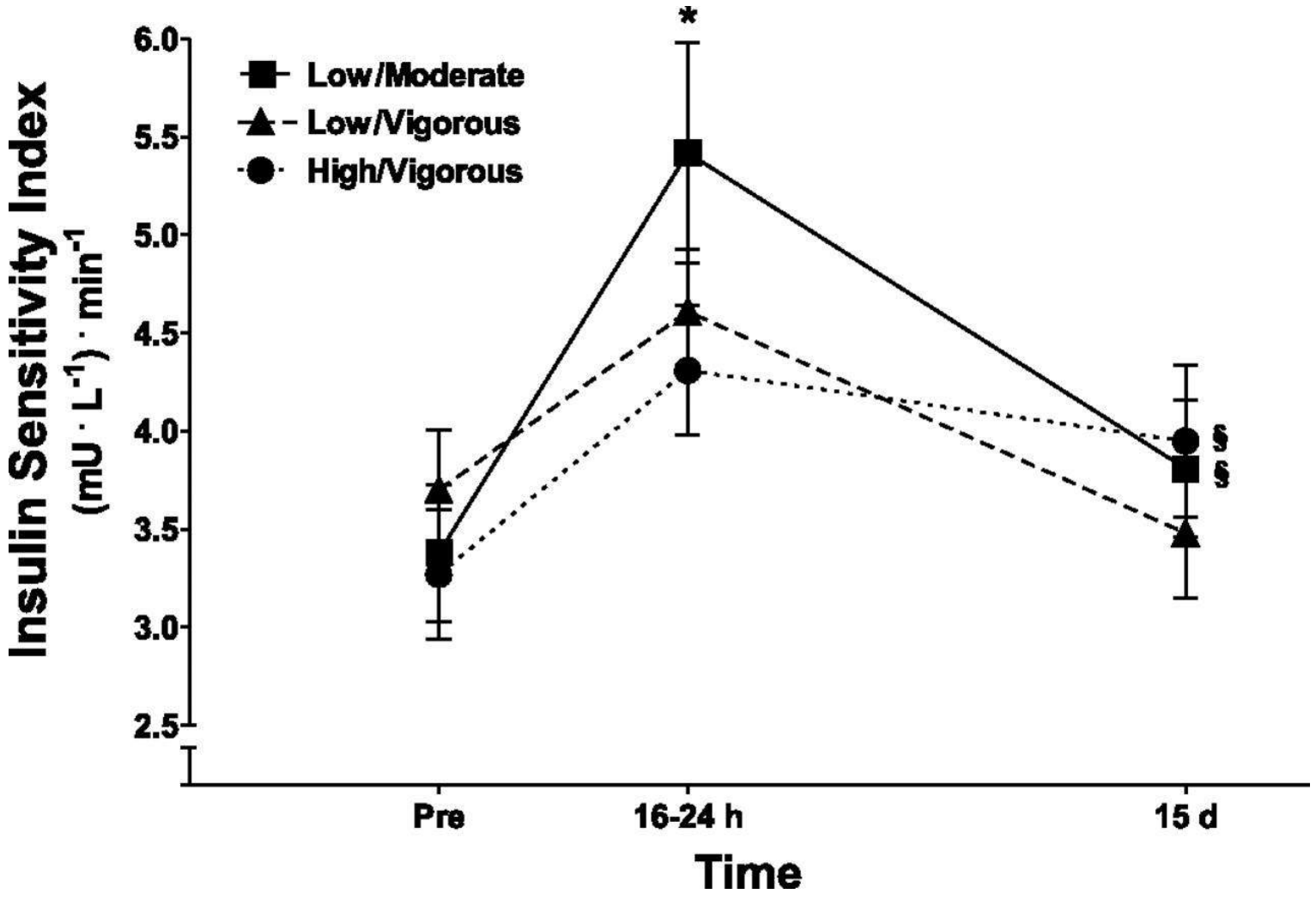
Changes in Hemoglobin A_{1c}, Blood Pressure, and Lipid Values

Akut olarak insülin direncine etkiler

Egzersiz 2-72 saat arasında insulin direncini önemli ölçüde azaltır

Kategori A

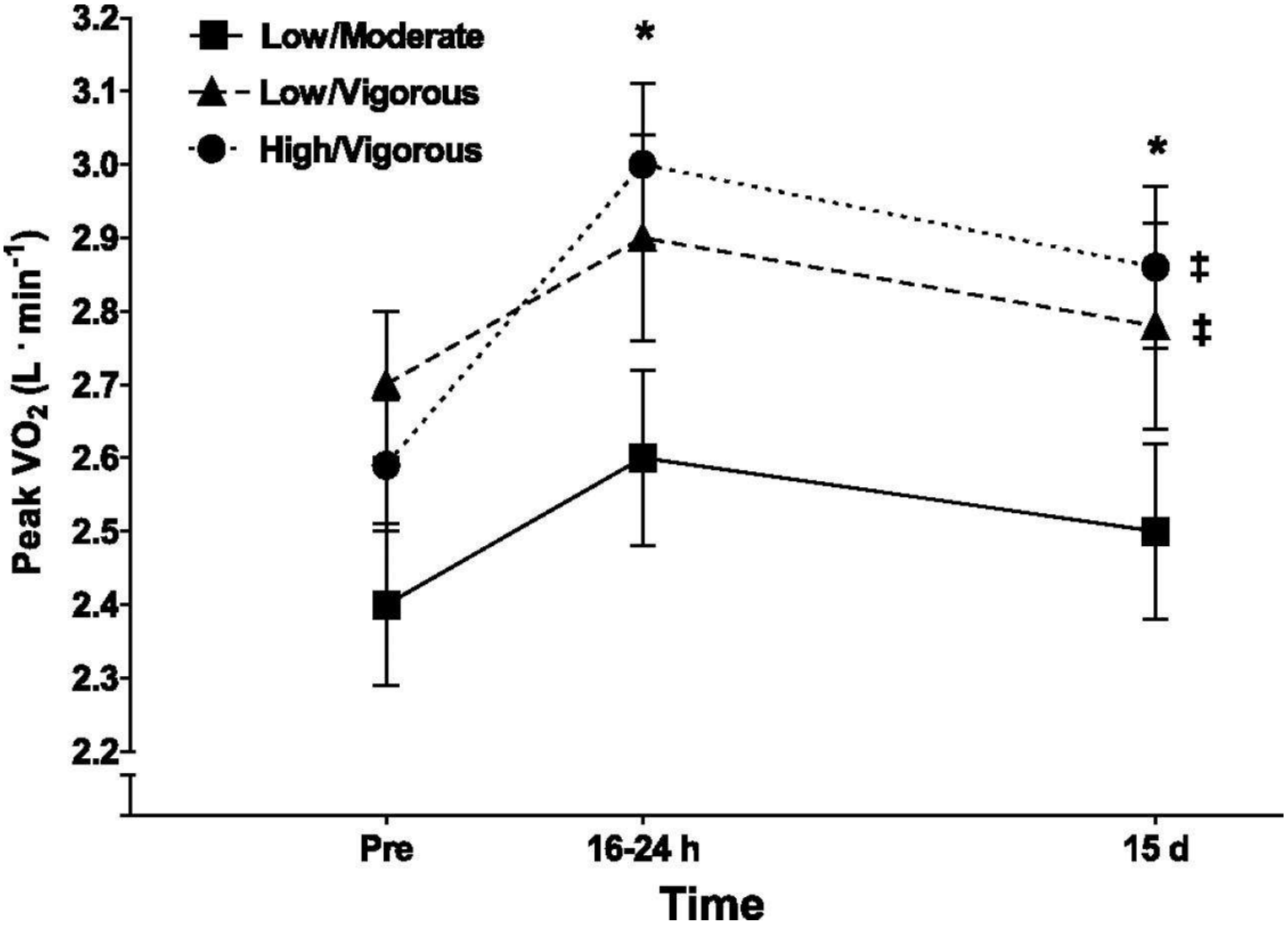
Insulin sensitivity index (SI) before exercise training (Pre) and after 16–24 h and 15 days of training cessation.



Bajpeyi S et al. J Appl Physiol 2009;106:1079-1085

Journal of Applied Physiology

Peak O2 consumption (V̇o2peak) before exercise training (Pre) and after 16–24 h and 15 days of training cessation.



Bajpeyi S et al. J Appl Physiol 2009;106:1079-1085

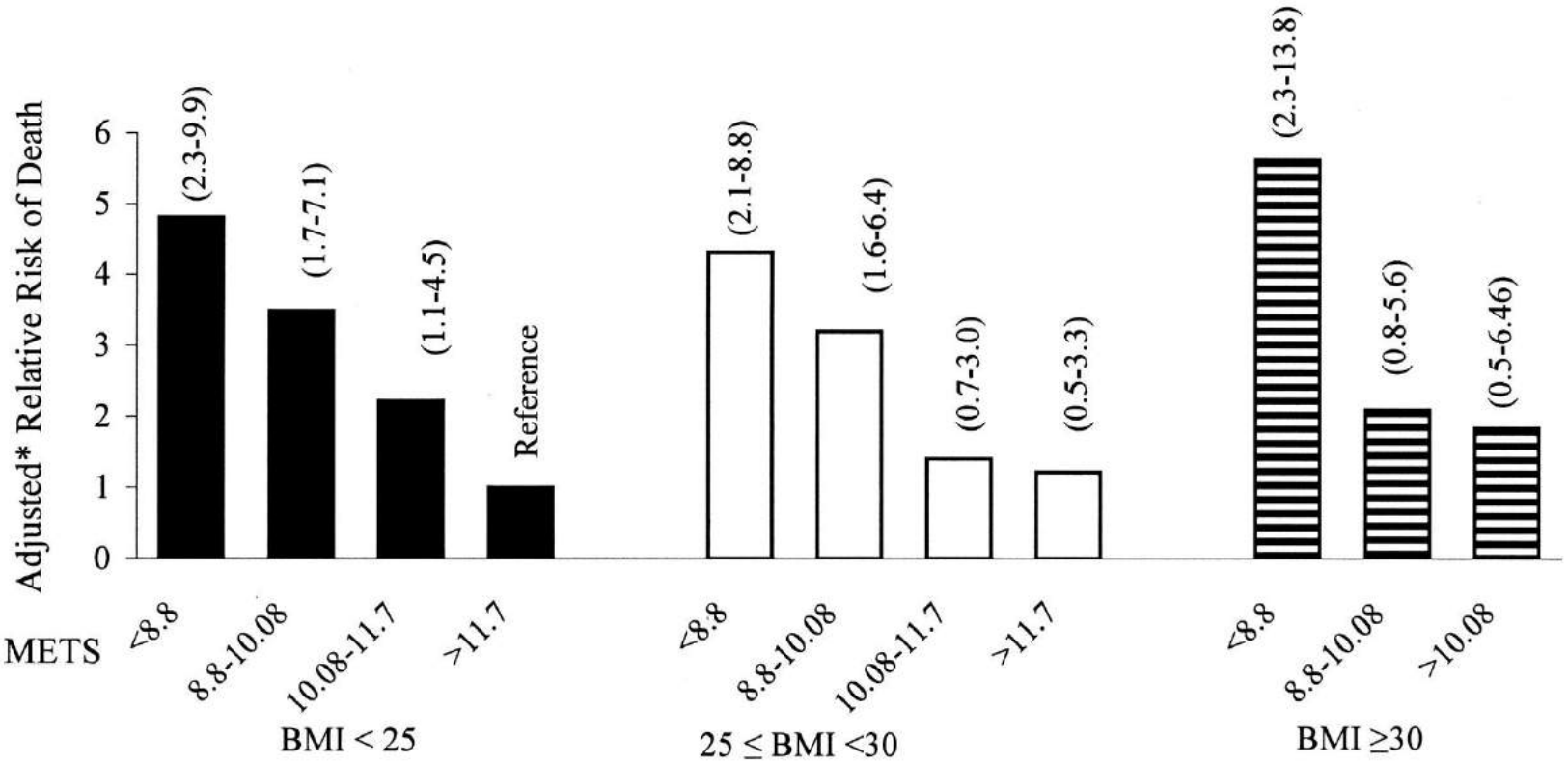
Journal of Applied Physiology

Mortalite

Egzersiz ve yüksek kardiyorespiratuar fitness diyabetiklerde mortaliteyi azaltır.

Kategori C

Data from 2,196 men with diabetes with 275 all-cause deaths during 32,161 person-years of observation.



Church T S et al. Dia Care 2004;27:83-88

Egzersizin diyabetiklerdeki psikolojik etkileri ve depresyon

Yüksek fitness yasam kalitesini artırıp depresyon skorlarını azaltır

Kategori B

From: **Impact of a Weight Management Program on Health-Related Quality of Life in Overweight Adults With Type 2 Diabetes**

Arch Intern Med. 2009;169(2):163-171. doi:10.1001/archinternmed.2008.544

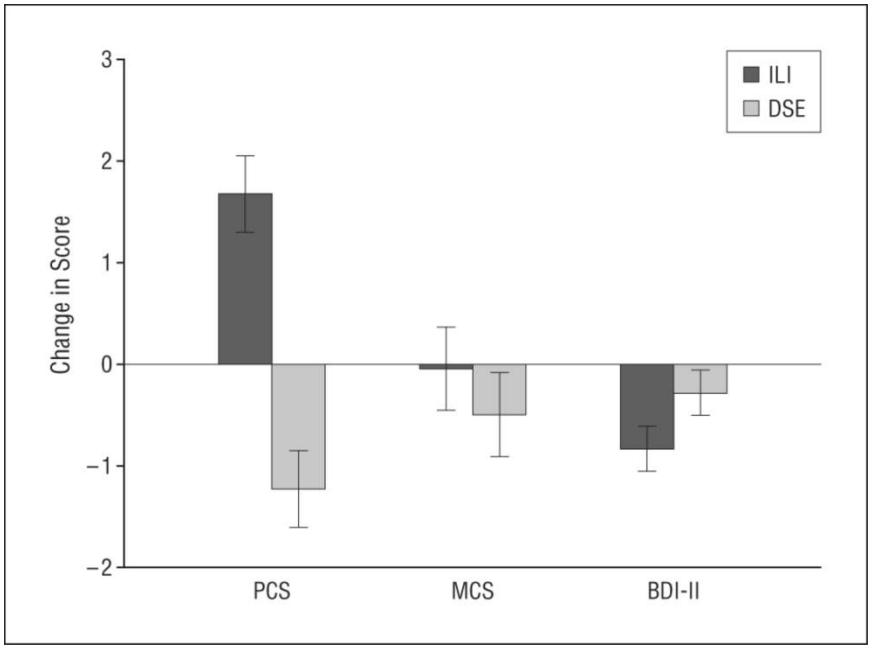


Figure Legend:

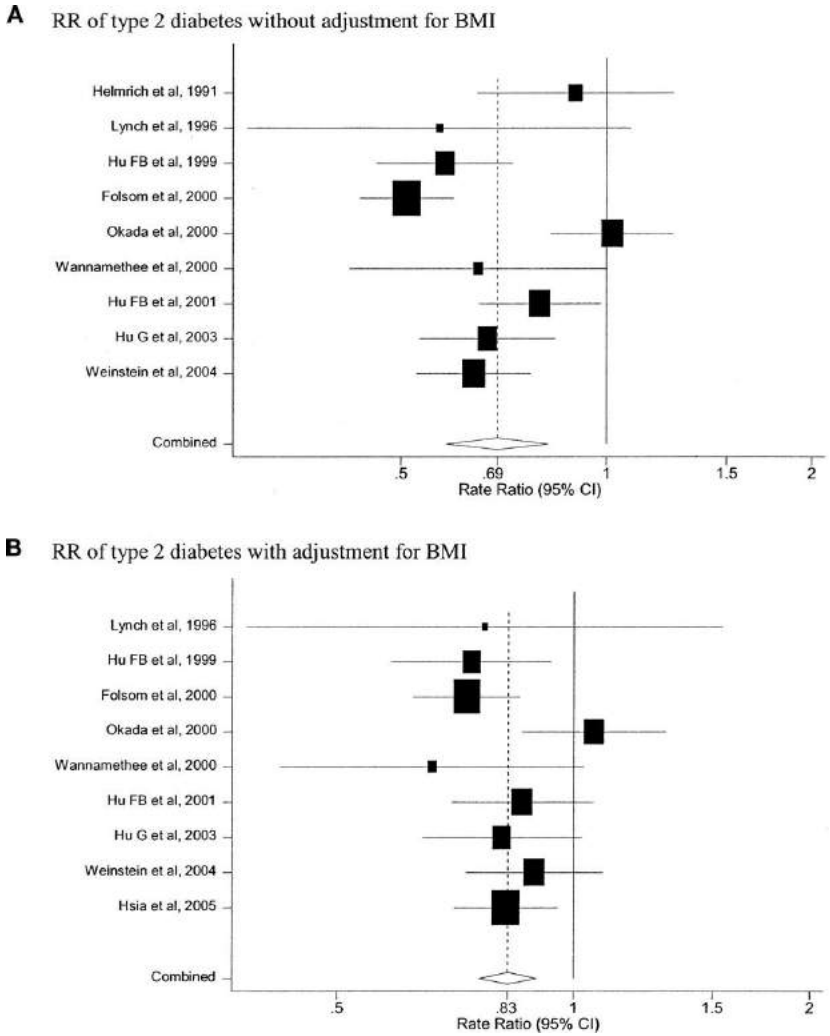
Mean changes in measures of health-related quality of life (the physical component summary [PCS] and health component summary [MCS] scores of the 36-Item Short-Form Health Survey, and the Beck Depression Inventory II [BDI-II] score) as a function of treatment arm. Error bars reflect 99% confidence intervals. DSE indicates diabetes support and education; ILI, intensive lifestyle intervention.

Diyabetin önlenmesi

En az haftada 2.5 saatlik orta ve şiddetli egzersiz yüksek riskli erişkinlerde tip 2 diyabet gelişimini önler

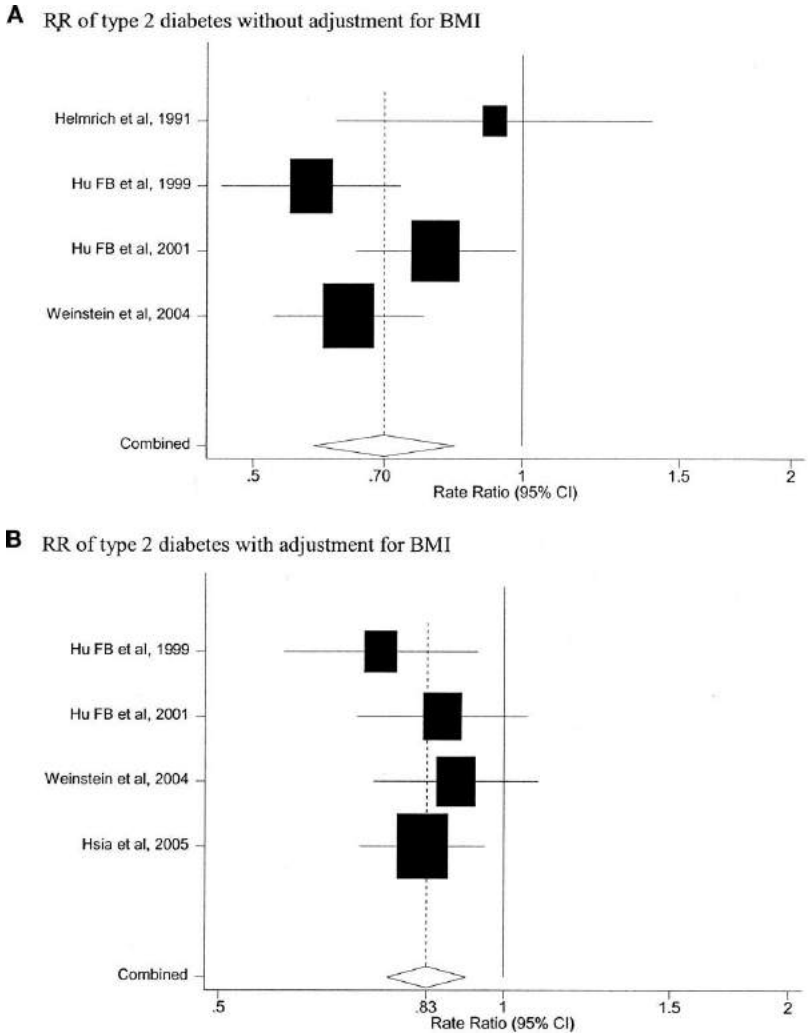
Kategori A

RRs for total physical activity of moderate intensity and incidence of type 2 diabetes for individual cohort studies and all studies combined without adjustment for BMI (A) and with adjustment for BMI (B).



Jeon C Y et al. Dia Care 2007;30:744-752

RRs for walking and incidence of type 2 diabetes for individual cohort studies and all studies combined without adjustment for BMI (A) and with adjustment for BMI (B).



Jeon C Y et al. Dia Care 2007;30:744-752

Egzersiz öncesi medikal değerlendirme

Diyabetik ve sedanter insanlar hızlı yürüme dışında bir egzersiz programına başlamadan önce bir hekim tarafından değerlendirilmelidir.
Yüksek riskli olanlara eforlu EKG yapılması uygun olur.

Kategori C

Eforlu EKG kime yapılmalıdır ?

40 yaşın üzerinde herkes

30 yaşın üzerinde ve

10 yılın üzerinde tip1 veya tip 2 diyabet

Hipertansiyon

Sigara

Dislipidemi

Retinopati

Nefropati (Mikroalbuminuri dahil)

Yaştan bağımsız olarak

Bilinen veya şüpheli koroner, serebrovaskuler veya periferik arteriyel hastalık

Otonom noropati

Böbrek yetersizliği

Diyabetikler için ne sıklıkta egzersiz

Haftada en az 150 dakika orta ve şiddetli egzersiz

En az 3 gün

Aralarda 2 günden fazla boşluk olmayacak şekilde

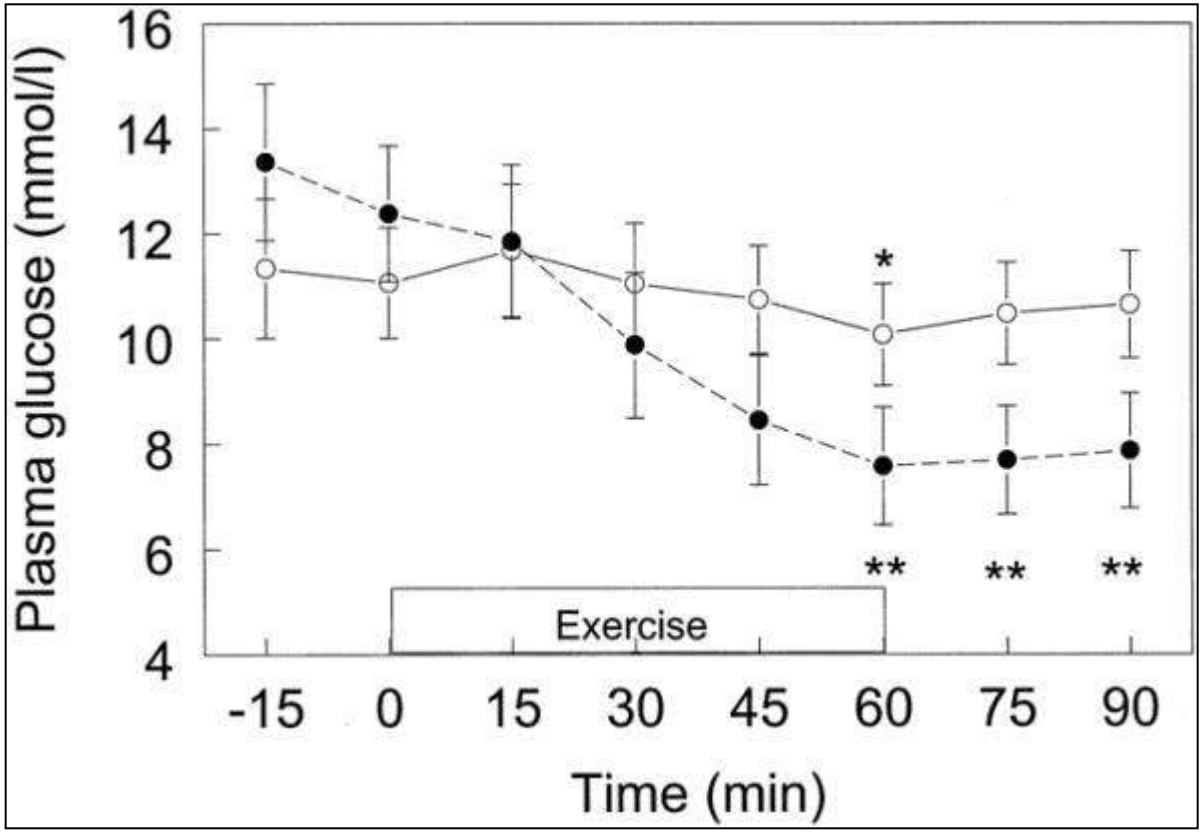
Kategori B

Şekerin yüksek olduğu günlerde egzersiz

Kan şekeri yüksek günlerde de (ketonemi ve dehidratasyon olmamak kaydıyla) egzersiz yapılabilir

Kategori C

FIGURE 1

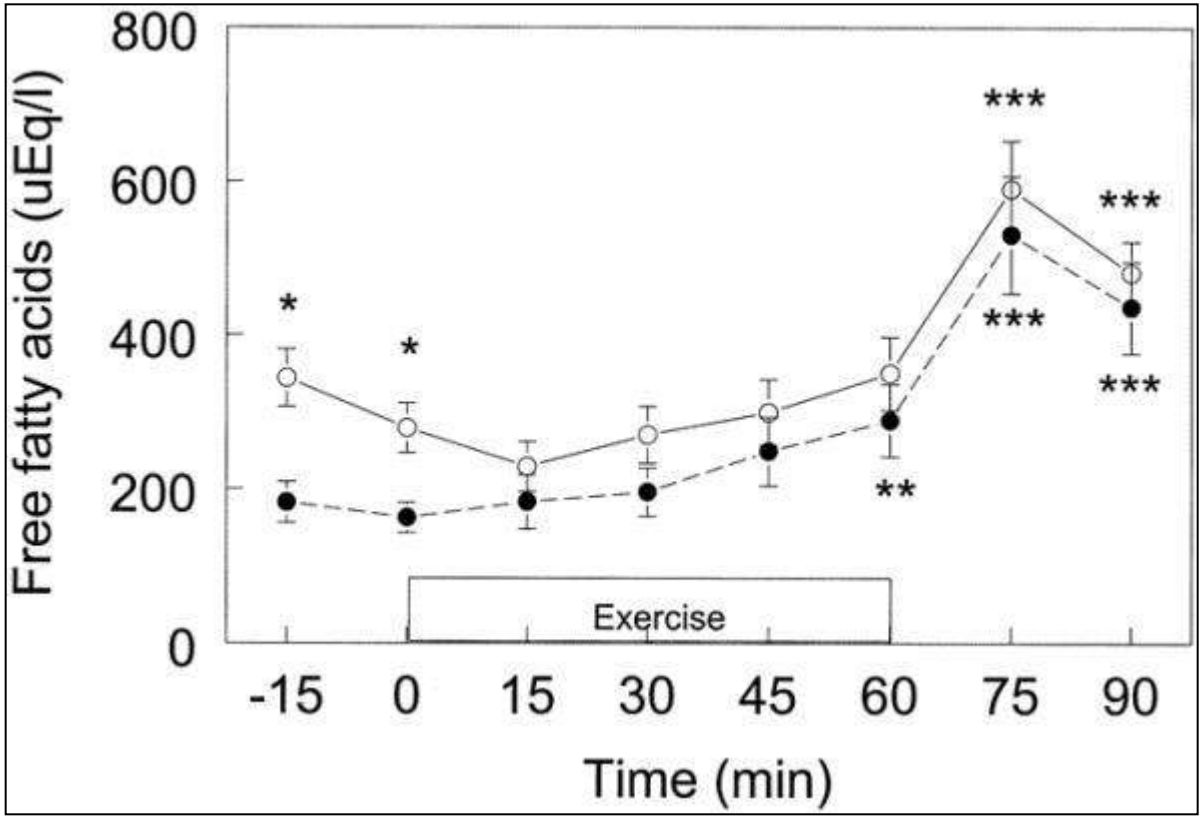


Prior meal enhances the plasma glucose lowering effect of exercise in type 2 diabetes.
POIRIER, PAUL; MAWHINNEY, SAMANTHA; GRONDIN, LUC; TREMBLAY, ANGELO; BRODERICK, TOM; CLEROUX, JEAN; CATELLIER, CLAUDE; TANCREDE, GILLES; NADEAU, ANDRE

Medicine & Science in Sports & Exercise. 33(8):1259-1264, August 2001.

FIGURE 1 - Plasma glucose concentrations in 10 subjects with type 2 diabetes in the fasted state (open symbols) and in the fed state (closed symbols) measured at 15-min intervals starting 15 min before exercise and up to 30 min after a 60-min exercise period. *P P < 0.001 baseline vs after 60 min of exercise.

FIGURE 2



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Medicine & Science in Sports & Exercise. 33(8):1259-1264, August 2001.

FIGURE 2 - Plasma free fatty acids concentrations in 10 subjects with type 2 diabetes in the fasted state (open symbols) and in the fed state (closed symbols) measured at 15-min intervals starting 15 min before exercise and up to 30 min after a 60-min exercise period. *P P P < 0.001 baseline vs recovery period (75 and 90 min).

Diyabetiklerde egzersizle hipoglisemi riski

İnsülin veya insülin sekretagoglari kullanmayan hastalarda egzersizle hipoglisemi riski artmaz. İnsülin veya sekretagog alan hastalar egzersiz sırasında veya sonrasında ek karbonhidrat alması gerekebilir

Kategori C

Diabetes Care. 1999 Oct;22(10):1647-54.

Interaction of sulfonylureas and exercise on glucose homeostasis in type 2 diabetic patients.

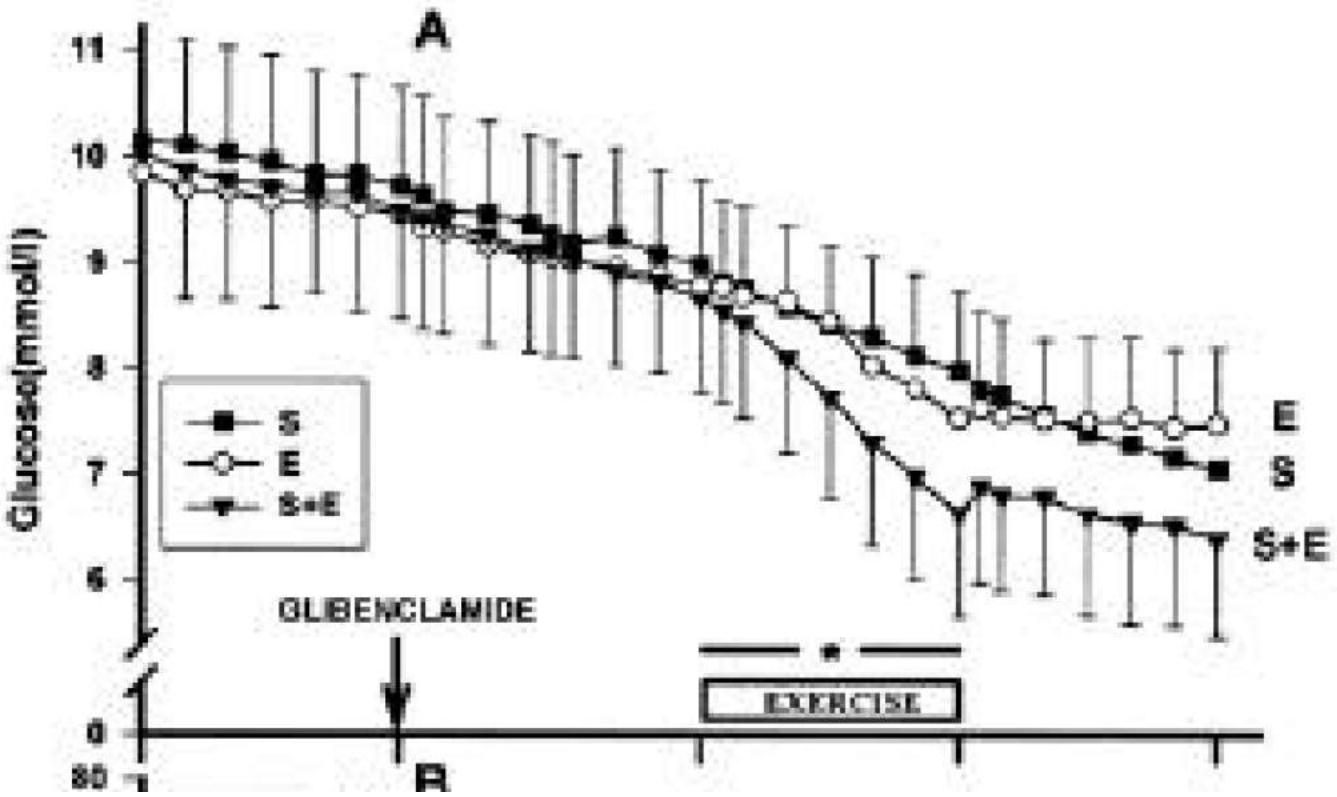

Figure 1—*Plasma glucose (A), insulin (B), and C-peptide (C) concentrations in eight type 2 diabetic patients studied on three occasions: ■, after sulfonylurea (glibenclamide, day S); ○, exercise (day E); and ▲, combined sulfonylurea and exercise (day S+E). Sulfonylurea was given to the subjects at 0 min on day S and day S+E. Exercise on day E and day S+E was performed from 70 to 130 min (day E, 57 ± 3% $\dot{V}O_{2max}$; day S+E, 58 ± 3% $\dot{V}O_{2max}$). Values are means ± SEM. The rate of decrease in glucose during exercise was higher on day S+E, compared with both day S and day E ($P < 0.05$). *$P < 0.05$ between average concentrations on all investigation days from 70 to 130 min; #$P < 0.05$ between average concentrations on day S+E and day E from 70 to 130 min.*

Her bir hareket özellikle diyabetik hastalar için altın değerindedir

- Yürümek harikadır
- Ancak çok daha fazlası da mümkün ve güvenli
- Diyabetik insanlarda daha uzun süreli ve daha intensif egzersizlere olanak sağlanmalıdır
- Egzersizin süre ve intensite artışının üst sınırı yoktur.
- Bu alandaki korkuyu üzerimizden atmalıyız.

The NEW ENGLAND JOURNAL of MEDICINE

N Engl J Med 2012;366:130-40.

ORIGINAL ARTICLE

Cardiac Arrest during Long-Distance Running Races

Jonathan H. Kim, M.D., Rajeev Malhotra, M.D., George Chiampas, D.O., Pierre d'Hemecourt, M.D., Chris Troyanos, A.T.C., John Cianca, M.D., Rex N. Smith, M.D., Thomas J. Wang, M.D., William O. Roberts, M.D., Paul D. Thompson, M.D., and Aaron L. Baggish, M.D., for the Race Associated Cardiac Arrest Event Registry (RACER) Study Group

Table 1. Participant Numbers, Absolute Number of Cardiac Arrests, and Incidence of Cardiac Arrest during Long-Distance Running Races in the United States, 2000–2010.

Variable	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009–2010*	Total
All participants (in thousands)											
Marathon — total no. (% men)	353 (65)	334 (64)	354 (64)	365 (62)	386 (59)	395 (60)	410 (60)	412 (59)	425 (59)	515 (59)	3949 (61)
Half-marathon — total no. (% men)	482 (53)	515 (52)	550 (51)	572 (52)	612 (51)	658 (47)	724 (47)	796 (45)	900 (44)	1113 (42)	6922 (48)
Total — no.	835	849	904	937	998	1053	1134	1208	1325	1628	10,871
Cardiac arrests											
Marathon — total no. (no. of men)	3 (3)	3 (1)	3 (1)	3 (2)	1 (1)	2 (2)	9 (9)	5 (5)	6 (5)	5 (5)	40 (34)
Half-marathon — total no. (no. of men)	0	0	1 (1)	4 (4)	1 (1)	0	1 (1)	2 (2)	0	10 (8)	19 (17)
Total — no. (no. of men)	3 (3)	3 (1)	4 (2)	7 (6)	2 (2)	2 (2)	10 (10)	7 (7)	6 (5)	15 (13)	59 (51)
	2000–2004			2005–2010*			P Value			2000–2010*	
Incidence of cardiac arrest — no./100,000 (95% CI)†											
Marathon‡	0.73 (0.39–1.24)			1.25 (0.83–1.82)			0.11			1.01 (0.72–1.38)	
Half-marathon‡	0.22 (0.08–0.48)			0.31 (0.17–0.53)			0.48			0.27 (0.17–0.43)	
Male sex§	0.55 (0.30–0.93)			1.17 (0.83–1.62)			0.02			0.90 (0.67–1.18)	
Female sex§	0.27 (0.09–0.63)			0.09 (0.02–0.27)			0.15			0.16 (0.07–0.31)	
Total	0.42 (0.25–0.66)			0.63 (0.45–0.86)			0.15			0.54 (0.41–0.70)	

* Data for 2010 include only the first 5 months (January 1 through May 31, 2010).

† Incidence rates were calculated as the simple proportion of events divided by the number of participants for stated time intervals. The 95% confidence intervals for event rates were computed with the use of a Poisson distribution. P values are for the incidence rates for 2000–2004 as compared with those for 2005–2010 and were computed with the use of a chi-square analysis of log-transformed Poisson event rates.

‡ Values represent pooled data for male and female participants.

§ Values represent pooled data for marathon and half-marathon participants.

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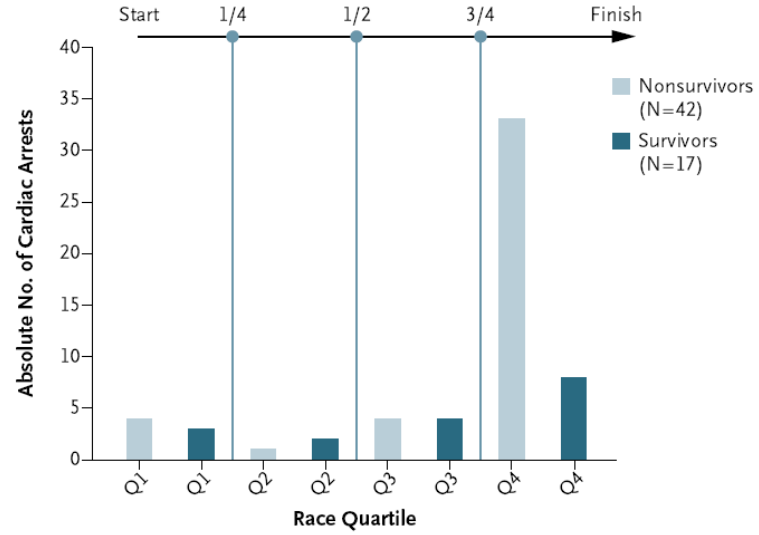

Figure 1. Location of Cardiac Arrest According to Race Quartile.

To account for differences in race distance between the marathon (26.2 mi) and half-marathon (13.1 mi), the point in the race course where the cardiac arrest occurred was examined as a function of the total race-distance quartile. Q1 denotes 0 to 6.5 mi (marathon) and 0 to 3.3 mi (half-marathon), Q2 6.5 to 13.1 mi (marathon) and 3.3 to 6.5 mi (half-marathon), Q3 13.1 to 20 mi (marathon) and 6.5 to 10 mi (half-marathon), and Q4 20 mi to finish (marathon) and 10 mi to finish (half-marathon).

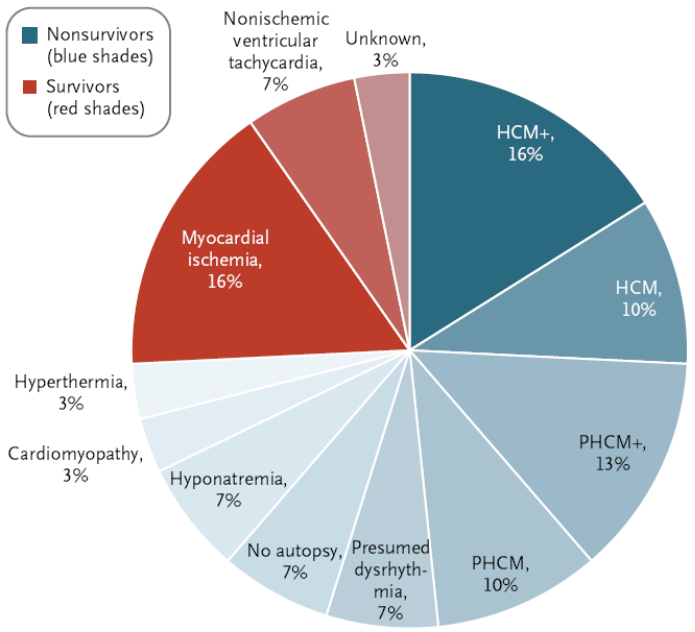

Figure 2. Causes of Cardiac Arrest among Nonsurvivors and Survivors.

HCM denotes hypertrophic cardiomyopathy; HCM+ denotes HCM and additional diagnoses, including coronary artery disease (in 2 persons), myocarditis (in 2), and bicuspid aortic-valve and coronary anomaly (in 1). PHCM denotes possible hypertrophic cardiomyopathy. PHCM+ denotes PHCM and additional diagnoses, including coronary artery disease (in 1 person), accessory atrioventricular nodal bypass tract (in 1), hyperthermia (in 1), and bicuspid aortic-valve and coronary anomaly (in 1). One nonsurvivor with hyponatremia was also found to have myxomatous valvular disease of the tricuspid, mitral, and aortic valves. Data include arrhythmogenic right ventricular cardiomyopathy (in 1 person). Because of rounding, percentages do not add up to 100.

Koşarken ölüm riski

- Maraton koşarken kardiak sebeplerden ölüm riskı arka plan popülasyonun çok altındadır.
- Maraton sırasında kardiak olum riski aynı surede maratonun koşulduğu şehirde trafik kazasından ölme riskinin yarısı kadardır.

Med Sci Sports Exerc. 2014 ; 46(5): 933–939. doi:10.1249/MSS.0000000000000197.

Reduced total and cause-specific mortality from walking and running in diabetes

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Life Sciences Division Lawrence Berkeley National Laboratory, Donner 464 1 Cycloton Road, Berkeley, CA 94720

Table 1

Baseline characteristics (mean±SD or percent) of the sample

	Walking or running energy expenditure					
	<1.07 MET-hours/d		1.07 to 1.8		≥1.8 MET-hours/d	
	Dead	Alive	Dead	Alive	Dead	Alive
Sample	162	626	57	276	112	927
Male (%)	52.47	44.50	59.65	38.41	75.00	54.69
Runners (%)	8.64	15.33	5.26	13.04	29.46	40.67
Prior Heart attack (%)	25.93	10.22	28.07	9.42	22.32	5.39
White (%)	76.54	71.41	87.72	79.71	83.04	84.25
Age (years)	70.19±12.08	57.51±13.01	69.41±12.23	55.60±12.58	66.18±13.17	53.30±13.25
Education (years)	13.90±2.68	14.59±2.68	14.52±2.79	14.97±2.61	15.05±2.68	15.45±2.66
Meat (servings/d)	0.47±0.43	0.55±0.49	0.59±0.48	0.48±0.39	0.52±0.51	0.45±0.40
Fruit (pieces/day)	1.38±1.05	1.41±1.08	1.75±1.09	1.67±1.42	1.67±1.09	1.77±1.27
Alcohol (g/d)	4.34±13.59	3.49±10.25	3.34±9.29	3.64±7.42	6.40±11.49	5.97±12.14
Aspirin use (tablets/d)	0.54±0.82	0.44±0.74	0.46±0.61	0.44±0.75	0.48±0.51	0.43±0.73
Body mass index(kg/m^2)	30.53±8.40	31.57±7.65	29.51±6.91	29.98±6.87	27.52±5.87	27.08±5.66

Hazard ratios (95% confidence interval) for total and cause-specific in 2,160 diabetic participants of the National Walkers' and Runners

	Categorical model, i.e. hazard ratios for categories of MET-hours/d run or walked relative to <1.07 MET-hours/d	
	1.07 to 1.8 MET-hours/d	**≥1.8 MET-hours/d**
Total mortality	0.925 (0.676, 1.247) P=0.61	0.635 (0.489, 0.821) P=0.0005
Underlying cause		
Cardiovascular disease (ICD_{10} I00–I99) 125 deaths	0.597 (0.339, 0.991) P=0.05	0.429 (0.275, 0.656) P=0.0001
Ischemic heart disease (ICD_{10}I20–I25) 82 deaths	0.535 (0.243, 1.055) P=0.07	0.663 (0.399, 1.088) P=0.10
Other cardiovascular disease, 43 deaths	0.666 (0.282, 1.340) P=0.30	0.121 (0.035, 0.318) P=0.0001
Underlying and contributing cause (All related deaths)		
Cardiovascular disease (ICD_{10} I00–I99) 213 deaths	0.762 (0.507, 1.115) P=0.17	0.541 (0.389, 0.745) P=0.0002
Ischemic heart disease (ICD_{10}I20–I25) 120 deaths	0.547 (0.294, 0.949) P=0.03	0.589 (0.385, 0.890) P=0.01
Dysrhythmias (ICD_{10}I46–I49) 72 deaths	0.493 (0.200, 1.053) P=0.07	0.705 (0.415, 1.190) P=0.19
Heart failure (ICD_{10}I20) 72 deaths	1.683 (0.814, 3.349) P=0.15	0.395 (0.170, 0.859) P=0.02
Cerebrovascular disease (ICD_{10}I60–I69) 32 deaths	0.622 (0.179, 1.674) P=0.04	0.448 (0.177, 1.031) P=0.06
Hypertensive disease (ICD_{10}I10–I13) 50 deaths	1.048 (0.495, 2.075) P=0.90	0.356 (0.167, 0.716) P=0.003
Sepsis (ICD_{10}A40– A41) 27 deaths	Not estimated	Not estimated
Chronic kidney disease (ICD_{10}N18) 18 deaths	0.170 (0.009, 0.867) P=0.03	0.195 (0.042, 0.647) P=0.006
Pneumonia and influenza (ICD_{10}J10–J18), 22 deaths	0.743 (0.168, 2.364) P=0.64	0.260 (0.067, 0.783) P=0.02

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Leisure-Time Running Reduces All-Cause and Cardiovascular Mortality Risk

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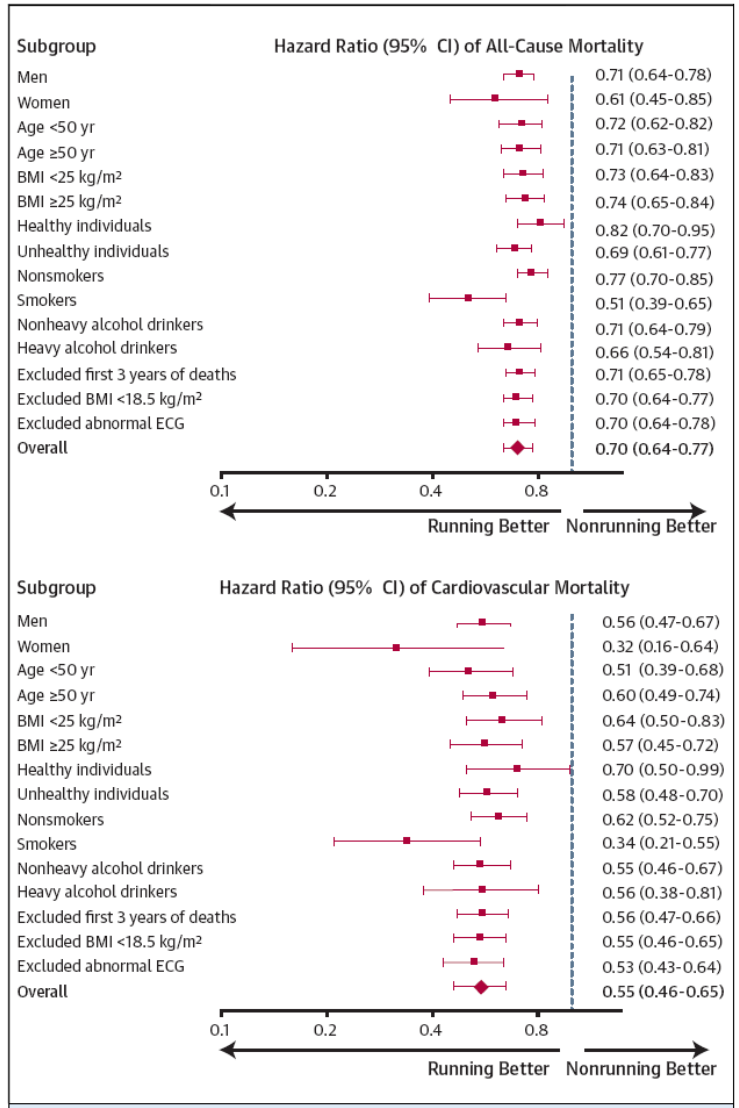


FIGURE 1 HRs of All-Cause and Cardiovascular Mortality by Subgroup

The reference group for all analyses includes nonrunners. All hazard ratios (HRs) were adjusted for baseline age (years), sex (not in sex-stratified analyses), examination year, smoking status (never, former, or current [not in smoking-stratified analyses]), alcohol consumption (heavy drinker or not [not in alcohol drinking-stratified analyses]), other physical activities except running (0, 1 to 499, or ≥500 MET-min/week), and parental cardiovascular disease (yes or no). Unhealthy was defined as the presence of 1 or more of the following health conditions: abnormal electrocardiogram (ECG), hypertension, diabetes, or hypercholesterolemia. Heavy alcohol drinking was defined as >14 and >7 drinks per week for men and women, respectively. BMI = body mass index.

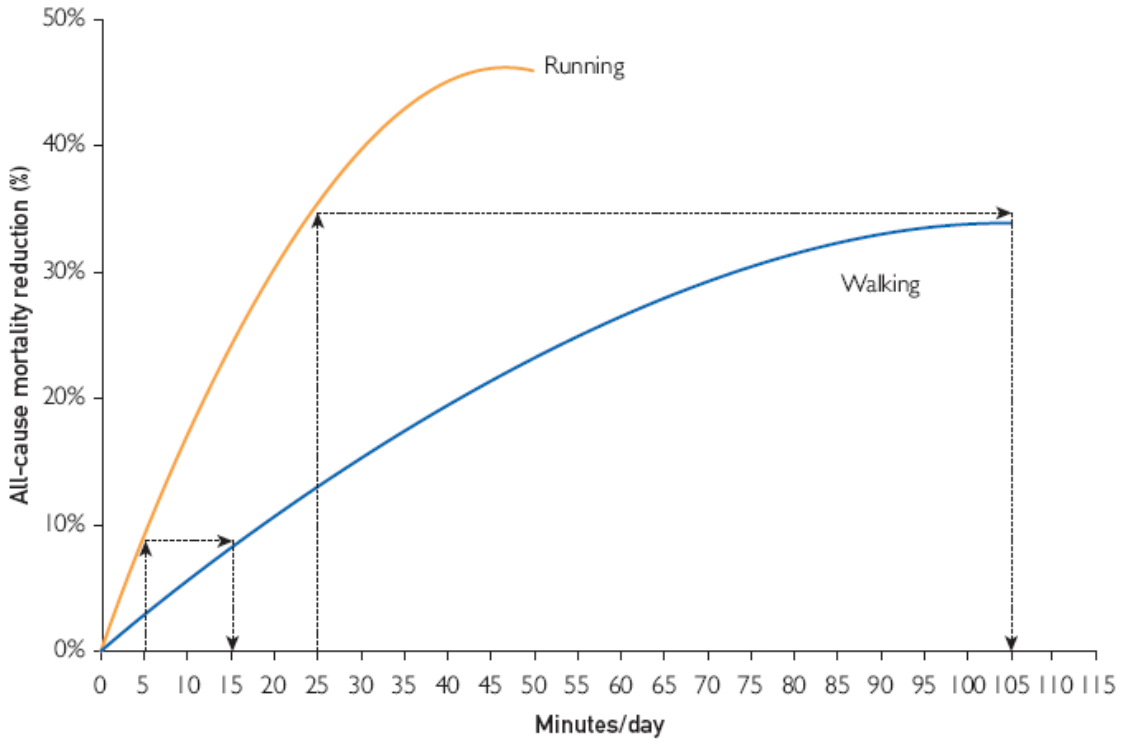
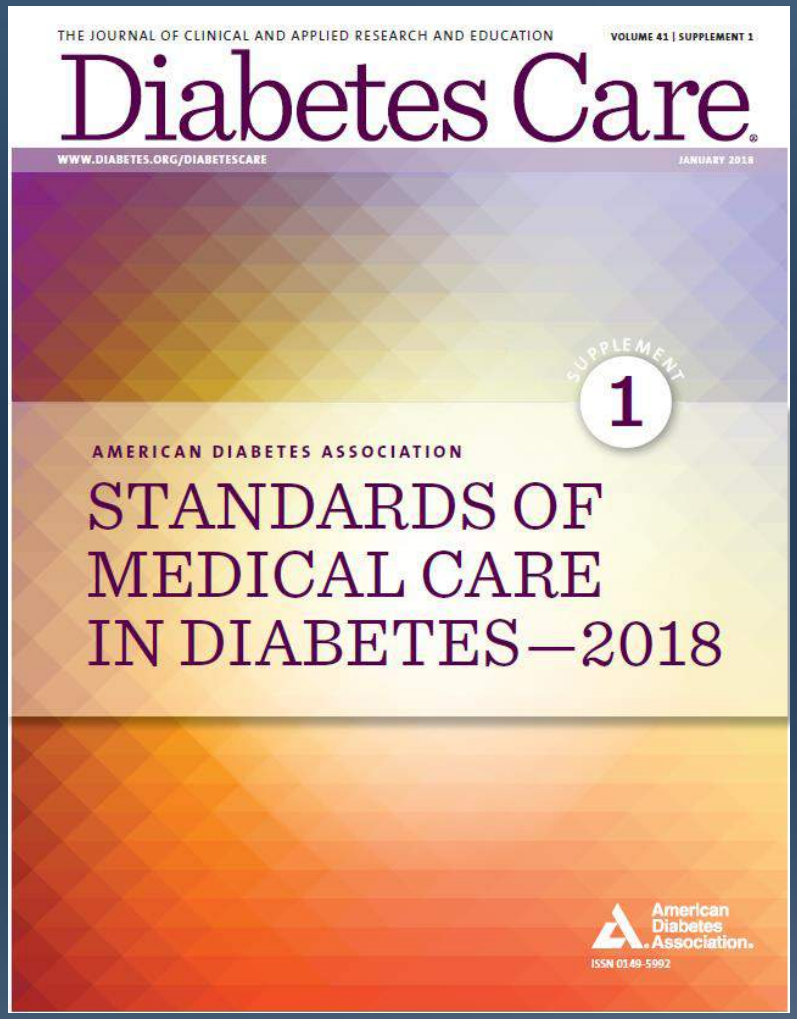


FIGURE 6. A 5-minute run generates the same benefits as a 15-minute walk, and a 25-minute run is equivalent to a 105-minute walk. Reproduced with permission from *J Am Coll Cardiol*.[57]

Wen CP, Wai JP, Tsai MK, Chen CH. Minimal amount of exercise to prolong life: to walk, to run, or just mix it up? *J Am Coll Cardiol*. 2014;64(5):482-484.



Standards of Medical Care in Diabetes - 2018

American Diabetes Association®

Physical Activity: Recommendations

- Children and adolescents with diabetes or prediabetes should engage in 60 min/day or more of moderate- or vigorous-intensity aerobic activity, with vigorous muscle-strengthening and bone-strengthening activities at least 3 days/week. C
- Most adults with type 1 C and type 2 B diabetes should engage in 150 min or more of moderate-to-vigorous intensity aerobic activity per week, spread over at least 3 days/week, with no more than 2 consecutive days without activity. Shorter durations (minimum 75 min/week) of vigorous-intensity or interval training may be sufficient for younger and more physically fit individuals.

Lifestyle Management:
Standards of Medical Care in Diabetes - 2018. *Diabetes Care* 2018; 41 (Suppl. 1): S38-S50

Recommendations: Physical Activity (2)

- Adults with type 1 C and type 2 B diabetes should engage in 2-3 sessions/week of resistance exercise on nonconsecutive days.
- All adults, and particularly those with type 2 diabetes, should decrease the amount of time spent in daily sedentary behavior. B Prolonged sitting should be interrupted every 30 min for blood glucose benefits, particularly in adults with type 2 diabetes. C
- Flexibility training and balance training are recommended 2–3 times/week for older adults with diabetes. Yoga and tai chi may be included based on individual preferences to increase flexibility, muscular strength, and balance. C

Lifestyle Management:
Standards of Medical Care in Diabetes - 2018. *Diabetes Care* 2018; 41 (Suppl. 1): S38-S50

TEMD ÖNERİLERİ

1. *Diyabetli bireyin fiziksel aktivitesini artırması, PG ve lipid düzeyleri ile KB kontrolünün sağlanmasını kolaylaştırır.*
2. *Fiziksel aktiviteyi artırmayı hedefleyen bir egzersiz programına başlamadan önce, diyabetli bireyin, egzersizin olası yan etkileri ve kontrendikasyonları yönünden dikkatli bir şekilde araştırılması gereklidir. KVH riski yüksek ve sedanter yaşam süren hastalarda egzersize başlamadan önce eforlu EKG yapılmalıdır (Sınıf D, ortak görüşe dayalı kanıt).*
3. *Egzersizi, kişisel gereksinimler, sınırlamalar ve kişisel performansa göre bireyselleştirmek gerekir (Sınıf D, ortak görüşe dayalı kanıt).*
4. *Prediyabetli ve diyabetli (özellikle tip 2) bireylerin, kilo vermeye yönelik olarak planlanan kalori kısıtlaması ile birlikte haftada toplam en az 150 dakika orta derecede aerobik fiziksel aktivite (ör. tempolu yürüme) programı uygulamaları gereklidir [Sınıf A, Düzey 2 kanıt (1)].*
5. *Egzersiz programı haftada en az 3 gün olmalı ve egzersizler arasında 2 günden fazla boşluk olmamalıdır [Tip 1 diyabetliler için: Sınıf C, Düzey 3 kanıt (2); tip 2 diyabetliler için: Sınıf B, Düzey 2 kanıt (3)].*
6. *Diyabetli bireylerin, ayrıca bir kontrendikasyon durumu yoksa, haftada 2 gün hafif rezistans egzersizleri de yapmaları önerilmelidir [Sınıf B, Düzey 2 kanıt (4,5)].*
7. *Egzersiz programı mümkünse bir egzersiz uzmanı tarafından, bireye uygun olarak düzenlenmeli ve başlangıçta uzman gözetimi altında yapılmalıdır (Sınıf D, ortak görüşe dayalı kanıt).*
8. *Egzersiz sırasında hastanın kendi kalp hızını izlemesi ve maksimal kalp hızının (Maksimal kalp hızı = 220 - yaş) %60-75'i civarında ayarlaması önerilir. İstirahat kalp hızına göre egzersiz kalp hızı bireysel olarak ayarlanabilir (Sınıf D, ortak görüşe dayalı kanıt).*
9. *Egzersiz öncesinde ve sonrasında ısınma ve soğuma egzersizleri ihmal edilmemelidir (Sınıf D, ortak görüşe dayalı kanıt).*