

Obezite, Diabet ve Sedanter Yaşam Kanser Arasında İlişki

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Tıbbi Onkoloji

Ders Planı

❑ Obezite tanımı

❑ İnsidans

❑ Obezite kanser ilişkisi

❑ Diabet/Metabolik sendrom kanser ilişkisi

❑ Sedanter yaşam kanser ilişkisi

Obezite Tanımı

BMI in kg/m ²	Weight Category
Below 18.5	Underweight
18.5 to 24.9	Normal
25.0 to 29.9	Overweight
30.0 to 39.9	Obese
40.0 or higher	Severely obese

Obezite Tanımı

❑ Sağlıklı kilonun değerlendirilmesi için kullanılan en basit yöntem BKİ'dir (beden kütle indeksi- BMI).

❑ $BKI = \text{vücut ağırlığı-kg} / (\text{boy uzunluğu-cm})^2$

❑ 18-25 arası → Normal

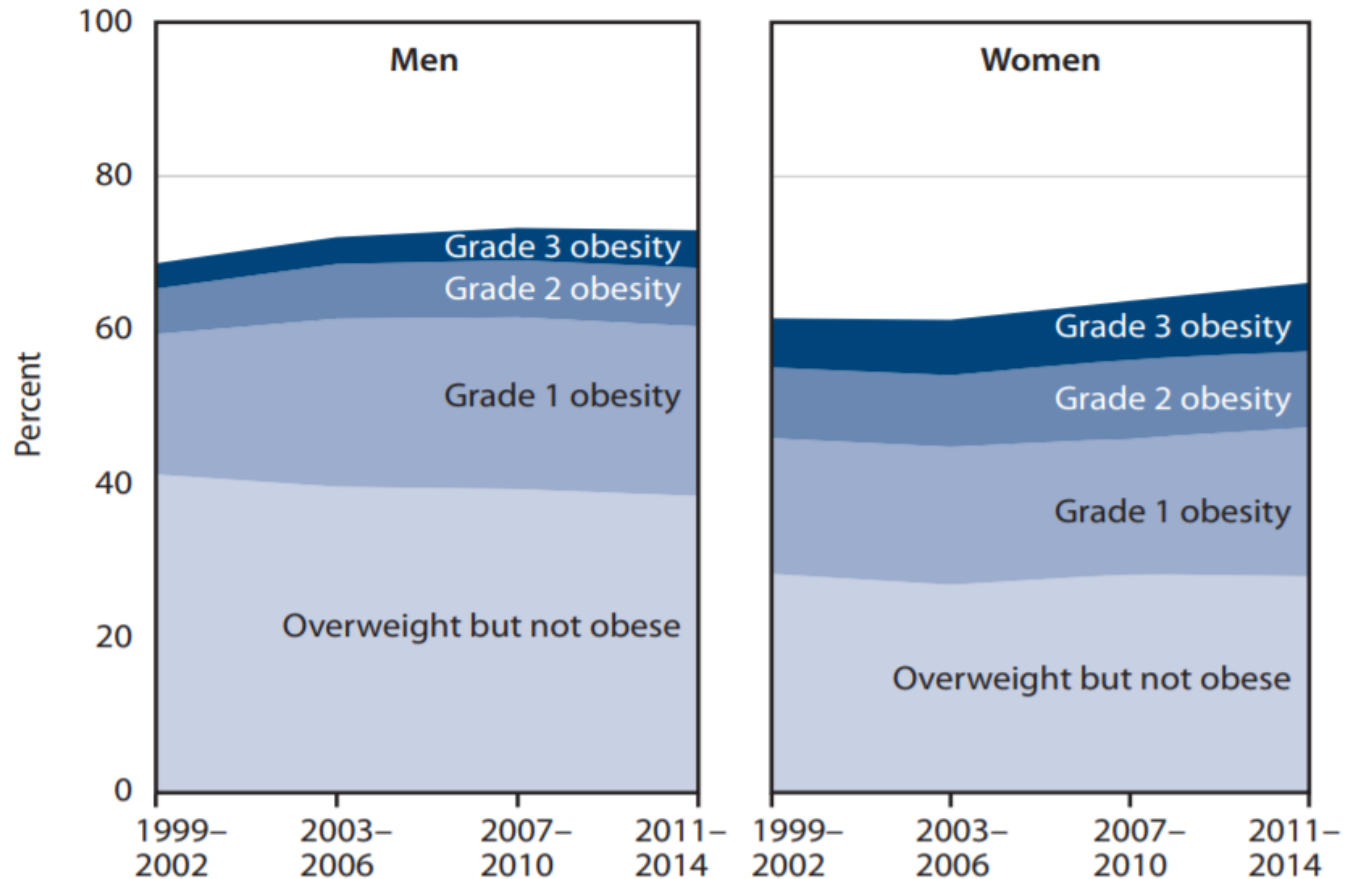
❑ ≥ 25 → Kilolu

❑ ≥ 30 → Obez

❑ ≥ 40 → Morbid Obez

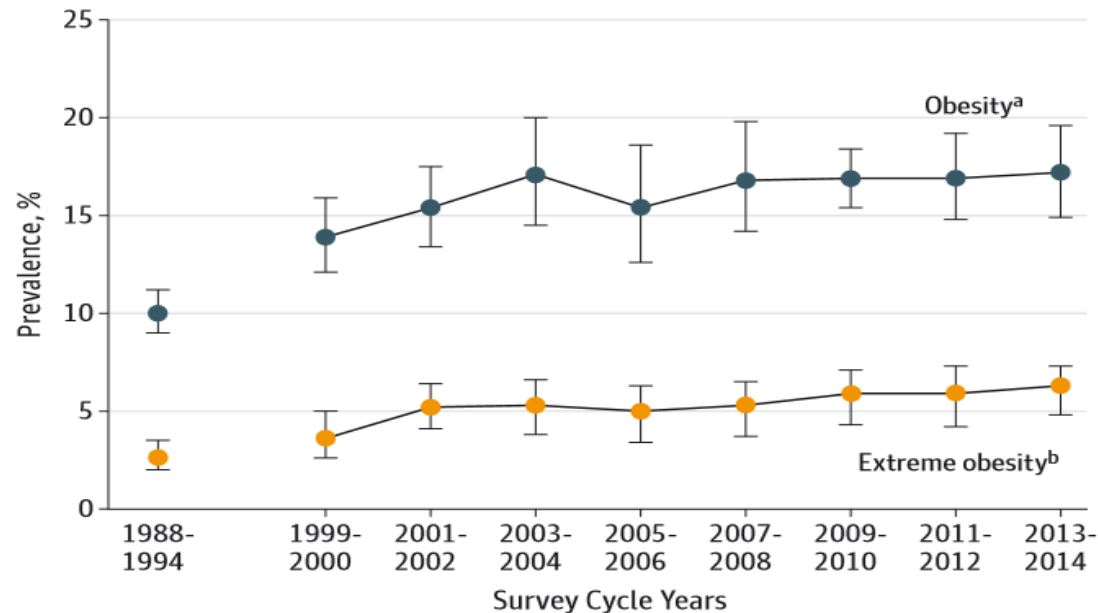
Obezite insidans

Figure 9. Overweight and obesity among adults aged 20 and over, by sex and grade of obesity: United States, 1999–2002 through 2011–2014



Obezite insidans

Figure 1. Prevalence of Obesity and Extreme Obesity in US Children and Adolescents Aged 2 to 19 Years From 1988-1994 Through 2013-2014



Data are from the National Health and Nutrition Examination Surveys. The error bars indicate 95% confidence intervals. The prevalence estimates are weighted.

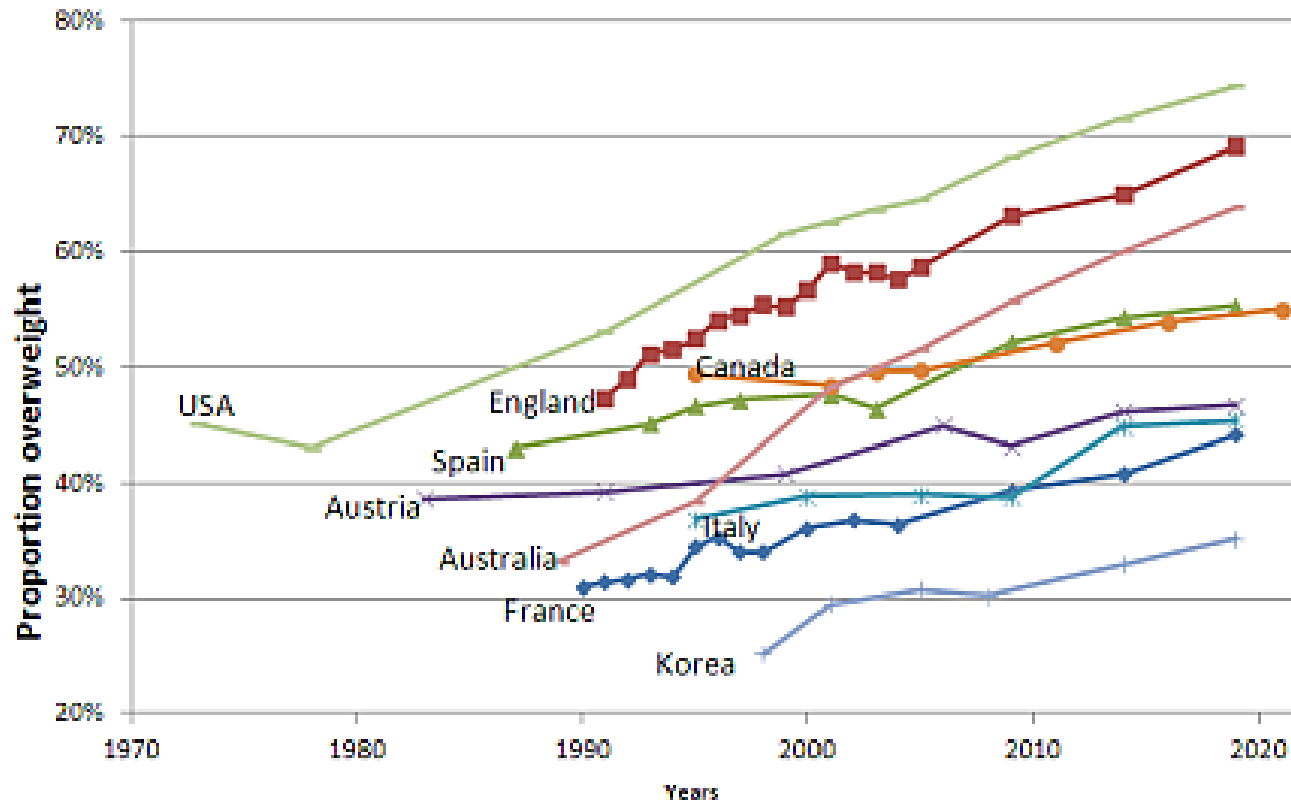
^a Defined as at or above the sex-specific 95th percentile on the US Centers for Disease Control and Prevention (CDC) BMI-for-age growth charts.

^b Defined as at or above 120% of the sex-specific 95th percentile on the CDC BMI-for-age growth charts.

Obezite insidans

Amerika nüfusunun %75'i 2020 yılında kilolu yada obez olması bekleniyor

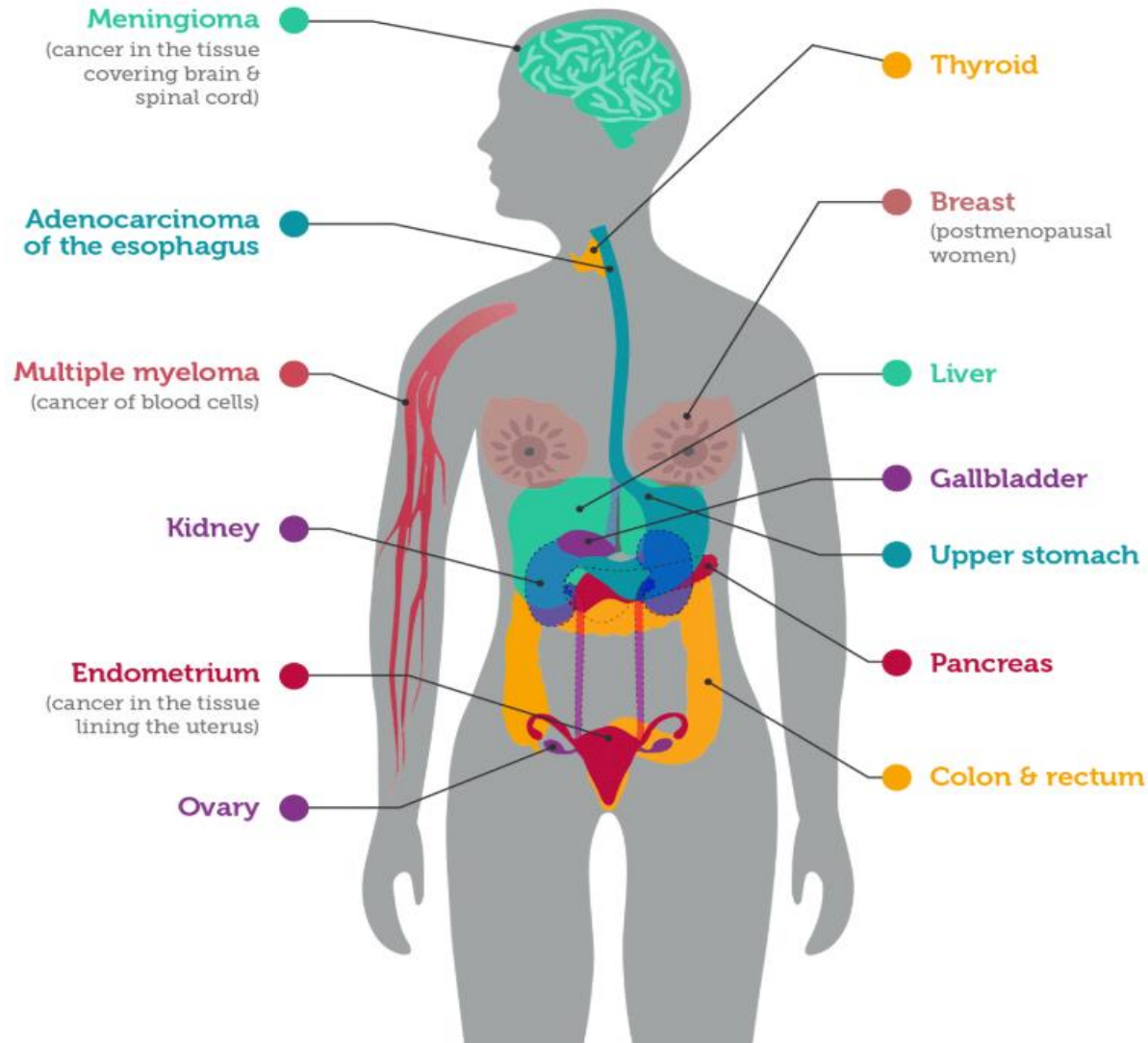
Past and projected future overweight rates in selected OECD countries



Obezite ile İlişkili Kanser Türleri

NATIONAL CANCER INSTITUTE

Cancers Associated with Overweight & Obesity



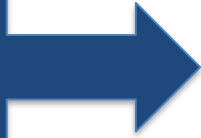
Obezite ile İlişkili Kanser Türleri

Cancer Site or Type	Strength of the Evidence in Humans†	Relative Risk of the Highest BMI Category Evaluated versus Normal BMI (95% CI)‡
Esophagus: adenocarcinoma	Sufficient	4.8 (3.0–7.7)
Gastric cardia	Sufficient	1.8 (1.3–2.5)
Colon and rectum	Sufficient	1.3 (1.3–1.4)
Liver	Sufficient	1.8 (1.6–2.1)
Gallbladder	Sufficient	1.3 (1.2–1.4)
Pancreas	Sufficient	1.5 (1.2–1.8)
Breast: postmenopausal	Sufficient	1.1 (1.1–1.2)§
Corpus uteri	Sufficient	7.1 (6.3–8.1)
Ovary	Sufficient	1.1 (1.1–1.2)
Kidney: renal-cell	Sufficient	1.8 (1.7–1.9)
Meningioma	Sufficient	1.5 (1.3–1.8)
Thyroid	Sufficient	1.1 (1.0–1.1)§
Multiple myeloma	Sufficient	1.5 (1.2–2.0)
Male breast cancer	Limited	NA
Fatal prostate cancer	Limited	NA
Diffuse large B-cell lymphoma	Limited	NA
Esophagus: squamous-cell carcinoma	Inadequate	NA
Gastric noncardia	Inadequate	NA
Extrahepatic biliary tract	Inadequate	NA
Lung	Inadequate	NA
Skin: cutaneous melanoma	Inadequate	NA
Testis	Inadequate	NA
Urinary bladder	Inadequate	NA
Brain or spinal cord: glioma	Inadequate	NA

Obezite ve Kanser ilişkisi

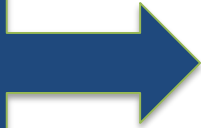
Yapılan çalışmalara göre;

**kilo kaybıyla
birlikte**



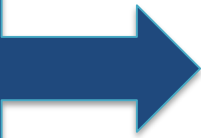
menapoz sonrası meme CA görülme riskinin düştüğü

**Abdominal
yağlanma ve
visseral yağ
dokusu**



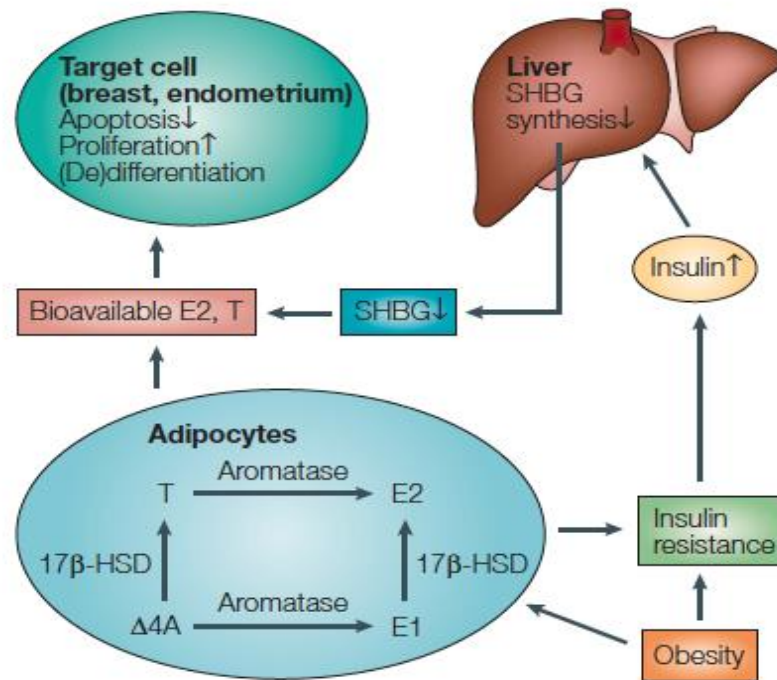
kolon kanserlerinin %70 'iyle ilişkili olduğu

**bu bölgede
artan yağ
dokusu**

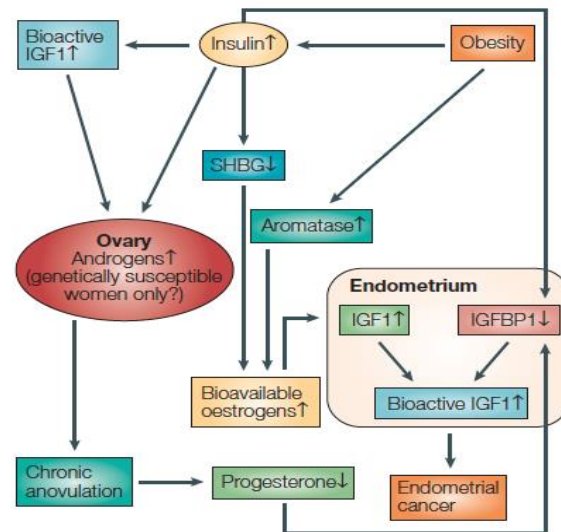


meme, pankreas, ve endometrial kanser riskini artırdığı görülmüştür.

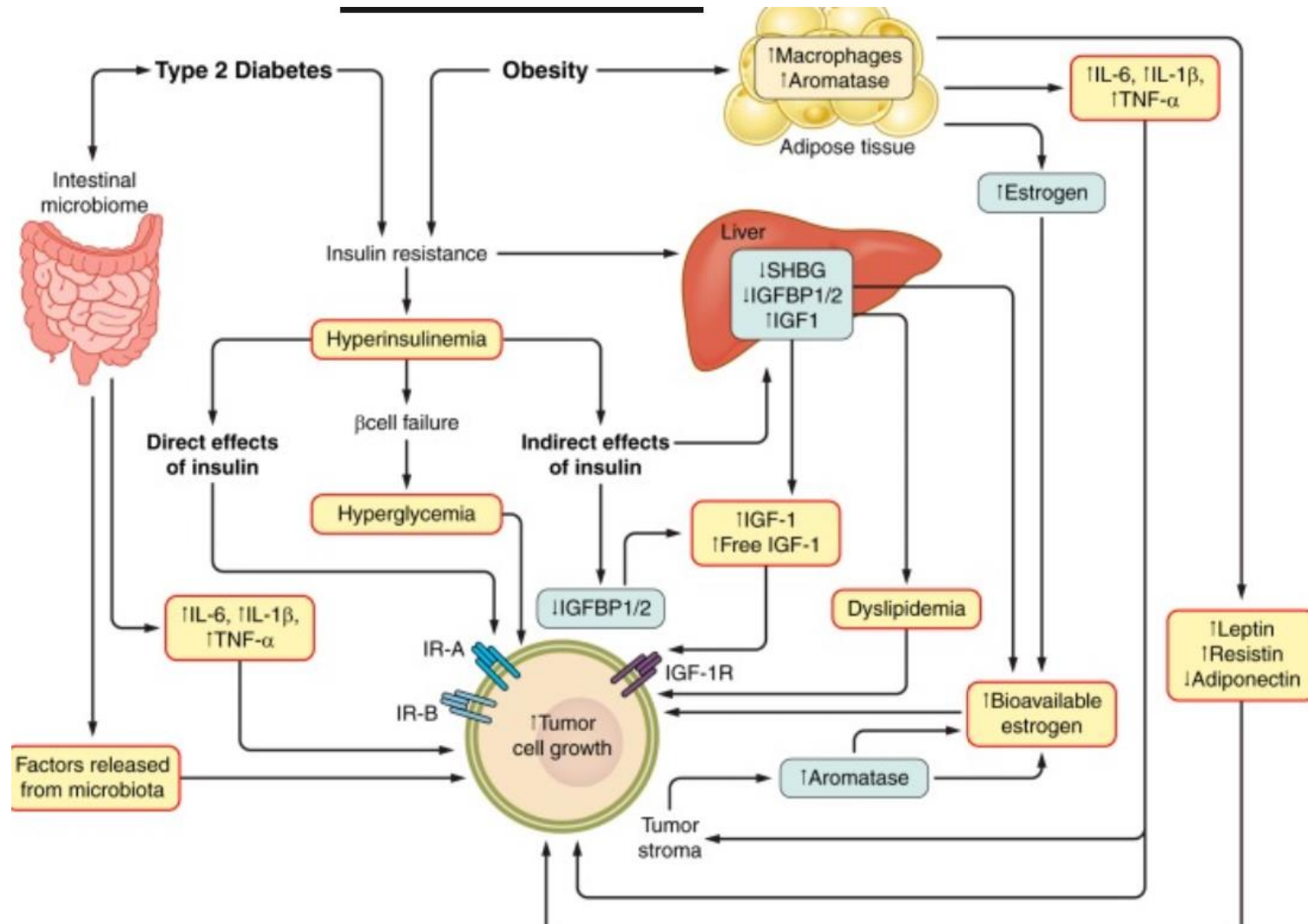
Effect of obesity on hormones



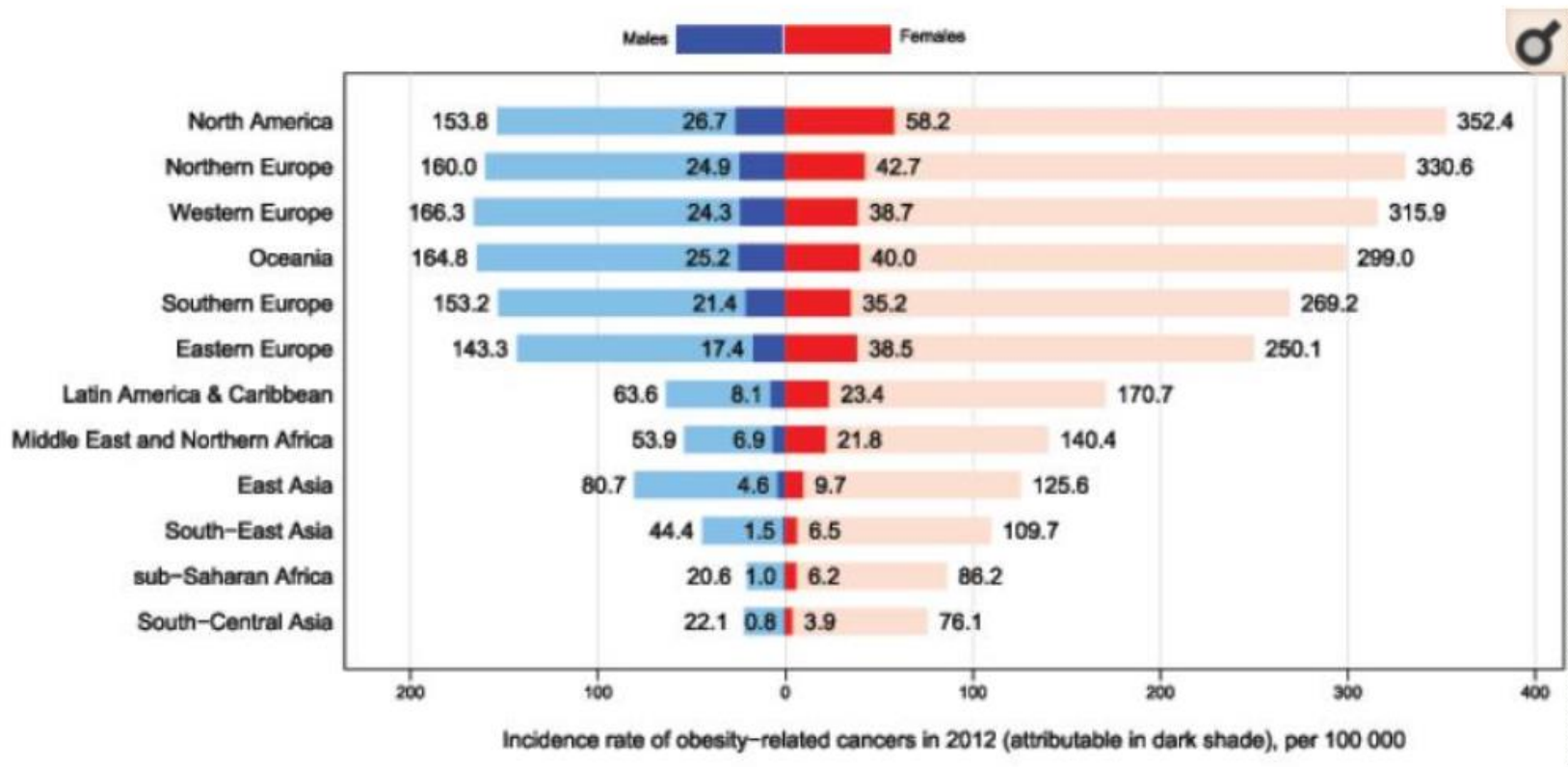
Obesity, Hormones and Endometrial Cancer



Obezite Kanser İlişkisi

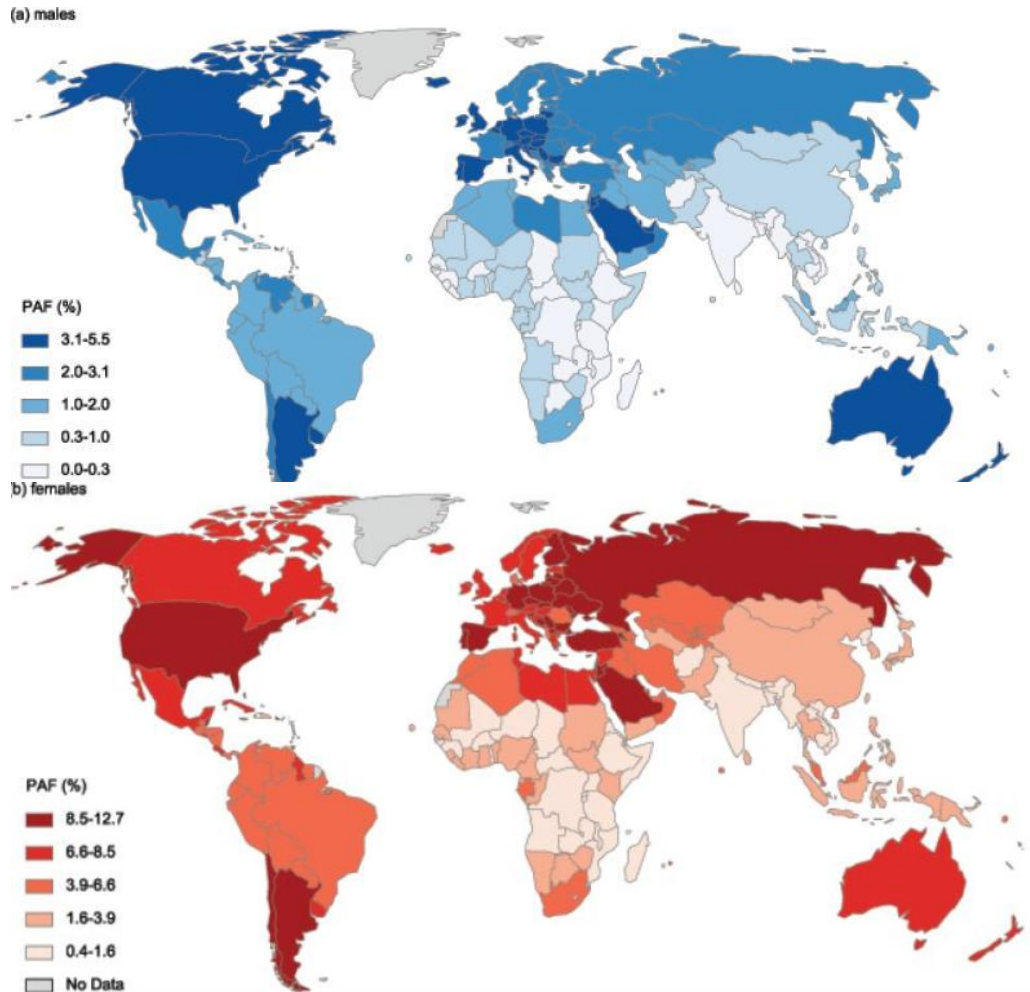


Obezite Kanser İlişkisi

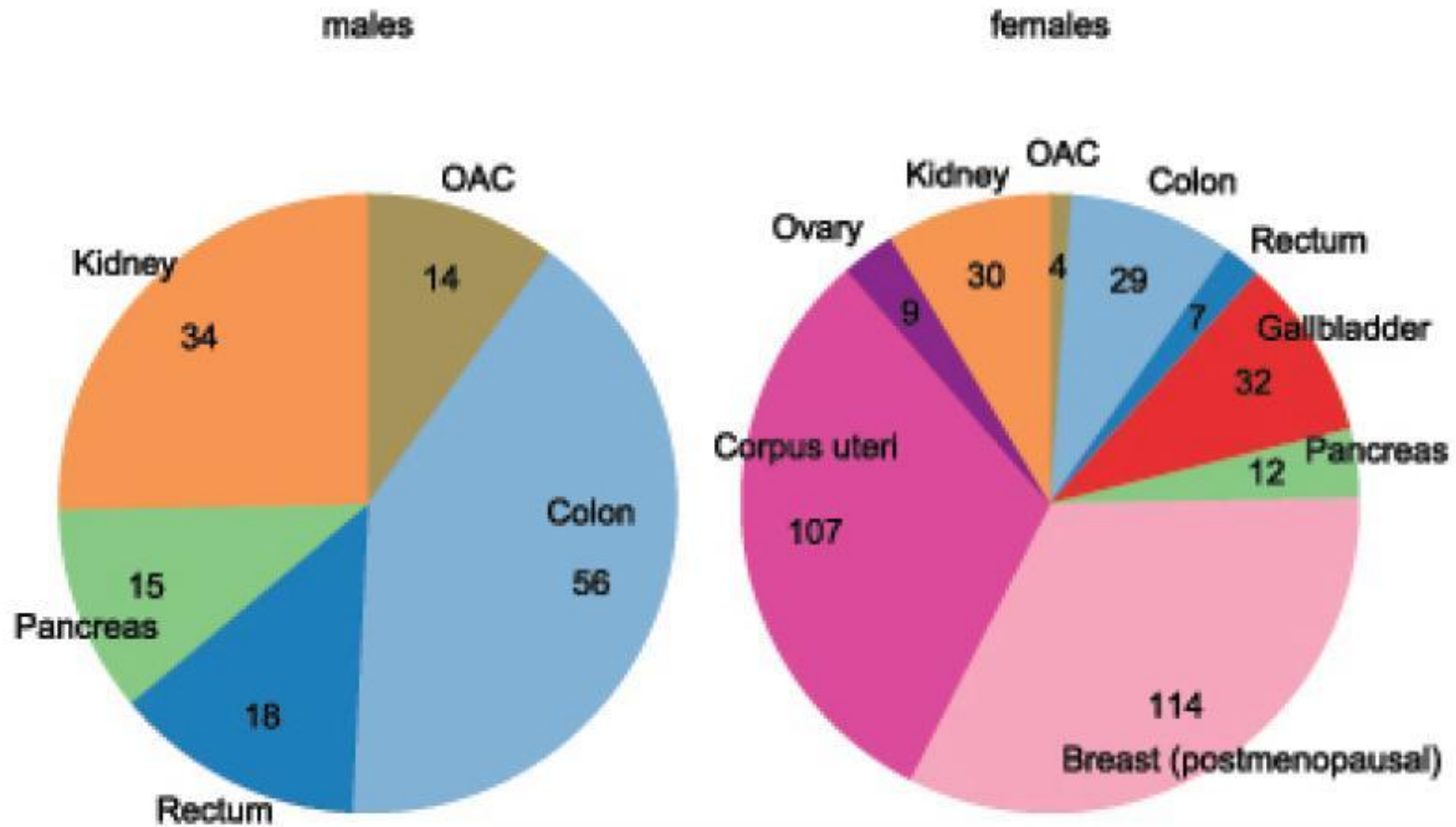


Arnold M, Lancet Oncology 2015

Obezite Kanser İlişkisi



Obezite Kanser İlişkisi



Arnold M, Lancet Oncology 2015

Obezite Kanser İlişkisi

12

D.C. Whiteman, L.F. Wilson / Cancer Epidemiology xxx (2016) xxx-xxx

Overweight/Obesity

Males

Oesophagus (adeno.) (n=212)

Colon (n=212)

Rectum (n=205)

Colorectal (n=8)

Gall bladder (n=7)

Pancreas (n=180)

Kidney (n=207)

Females

Oesophagus (adeno.) (n=206)

Colon (n=209)

Rectum (n=175)

Colorectal (n=8)

Gall bladder (n=198)

Pancreas (n=209)

Breast - postmenopausal (n=220)

Endometrium (n=219)

Ovary (n=179)

Kidney (n=204)

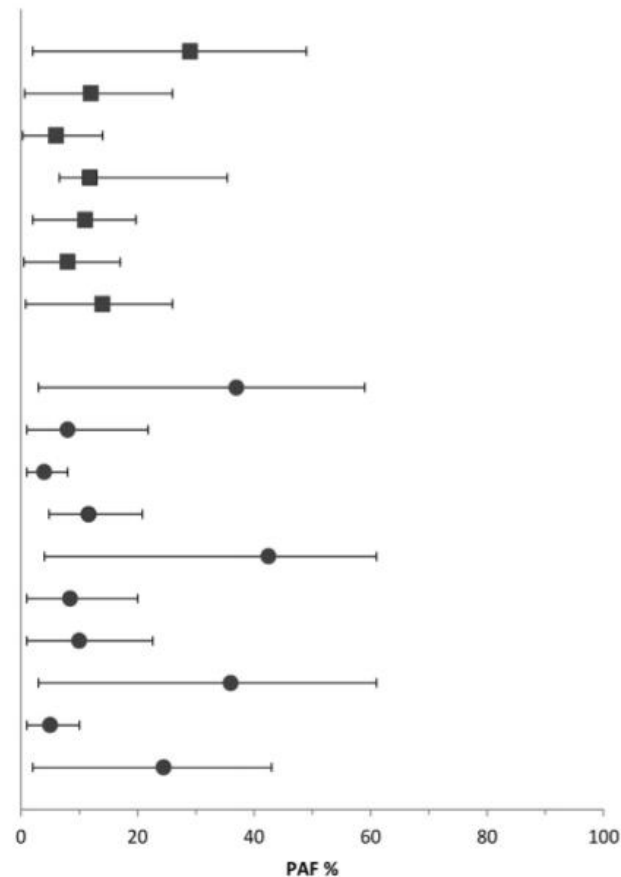


Fig. 5. Median and range of population attributable fractions, expressed as a percentage (PAF%), reported for overweight/obesity associated with specified cancers (n = number of PAFs reported). Symbols represent the median PAF% for males (■) and females (●) respectively; error bars represent the lowest and highest PAF% reported.

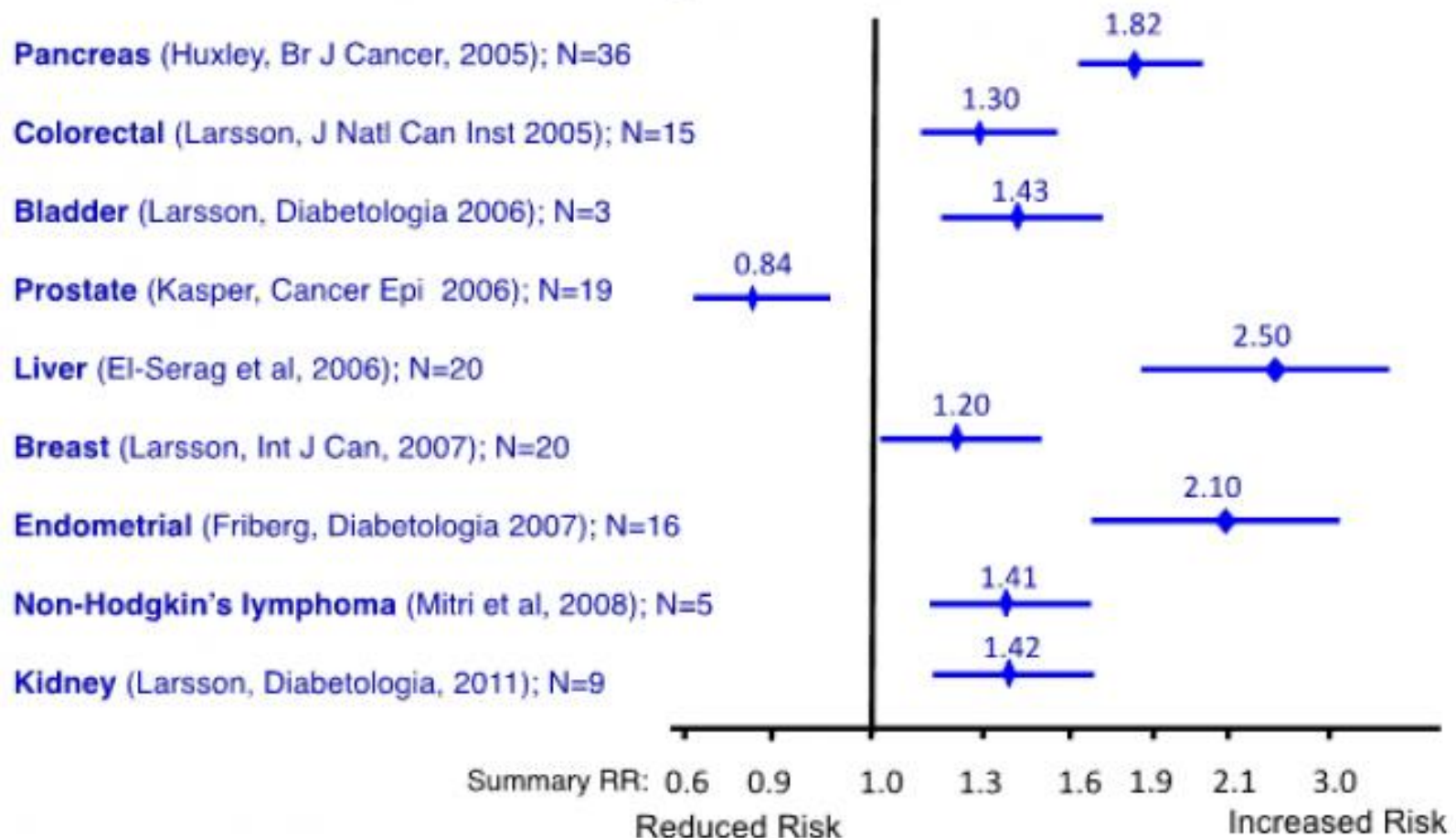
Obezite Kanser İlişkisi

Table 3.1
Obesity-related cancers

Type of cancer	Relative risk ^a with BMI of 25–30 kg/m ²	Relative risk ^a with BMI of ≥30 kg/m ²	PAF (%) for US population ^b	PAF (%) for EU population ^c
Colorectal (men)	1.5	2.0	35.4	27.5
Colorectal (women)	1.2	1.5	20.8	14.2
Female breast (post-menopausal)	1.3	1.5	22.6	16.7
Endometrial	2.0	3.5	56.8	45.2
Kidney (renal cell)	1.5	2.5	42.5	31.1
Esophageal (adenocarcinoma)	2.0	3.0	52.4	42.7
Pancreatic	1.3	1.7	26.9	19.3
Liver	ND	1.5–4.0	ND ^d	ND ^d
Gallbladder	1.5	2.0	35.5	27.1
Gastric cardia (adenocarcinoma)	1.5	2.0	35.5	27.1

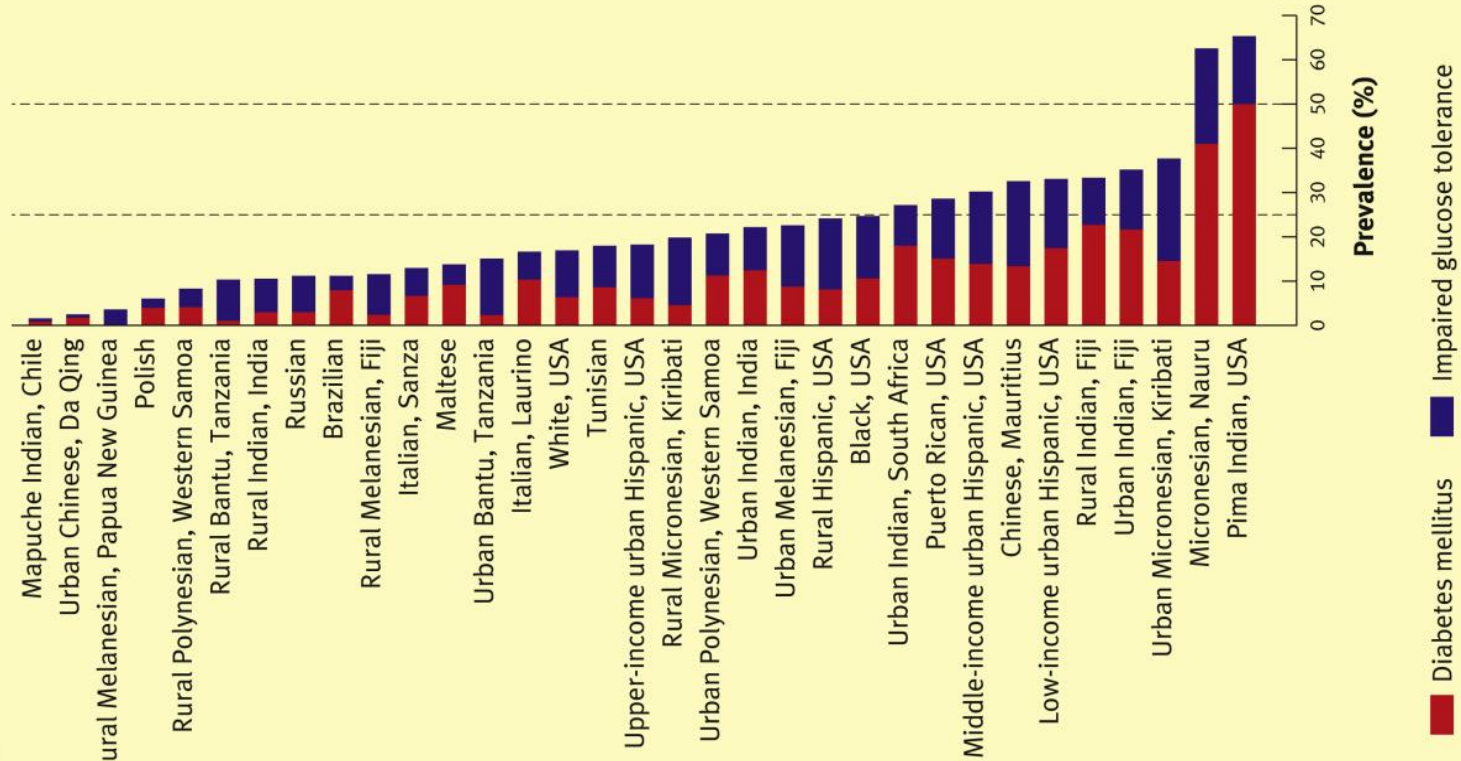
Diabet ve Kanser İlişkisi

Type 2 Diabetes: Association with Cancers Meta-analyses, 2005-2011



Diabet, Bozulmuş Glukoz Toleransı İnsidans

Age-standardized prevalence of type 2 diabetes and impaired glucose tolerance



Diabet ve Kanser İlişkisi

Cancer origin	Analyzed studies	RR (95% CI)
Liver	13 case-control studies	2.50 (1.8-3.5)
	7 cohort studies	2.51 (1.9-3.2)
Pancreas	17 case-control studies	1.94 (1.53-2.46)
	19 cohort studies	1.73 (1.59-1.88)
Kidney ^a	1 cohort study	1.50 (1.30-1.70)
	1 cohort study	2.22 (1.04-4.70)
Endometrium	13 case-control studies	2.22 (1.80-2.74)
	3 cohort studies	1.62 (1.21-2.16)
Colon/rectum	6 case-control studies	1.36 (1.23-1.50)
	9 cohort studies	1.29 (1.16-1.43)
Bladder	7 case-control studies	1.37 (1.04-1.80)
	3 cohort studies	1.43 (1.18-1.74)
Non-Hodgkin's lymphoma	11 case-control studies	1.12 (0.95-1.31)
	5 cohort studies	1.41 (1.07-1.88)
Breast	5 case-control studies	1.18 (1.05-1.32)
	15 cohort studies	1.20 (1.11-1.30)
Prostate	9 case-control studies	0.89 (0.72-1.11)
	10 cohort studies	0.81 (0.71-0.92)

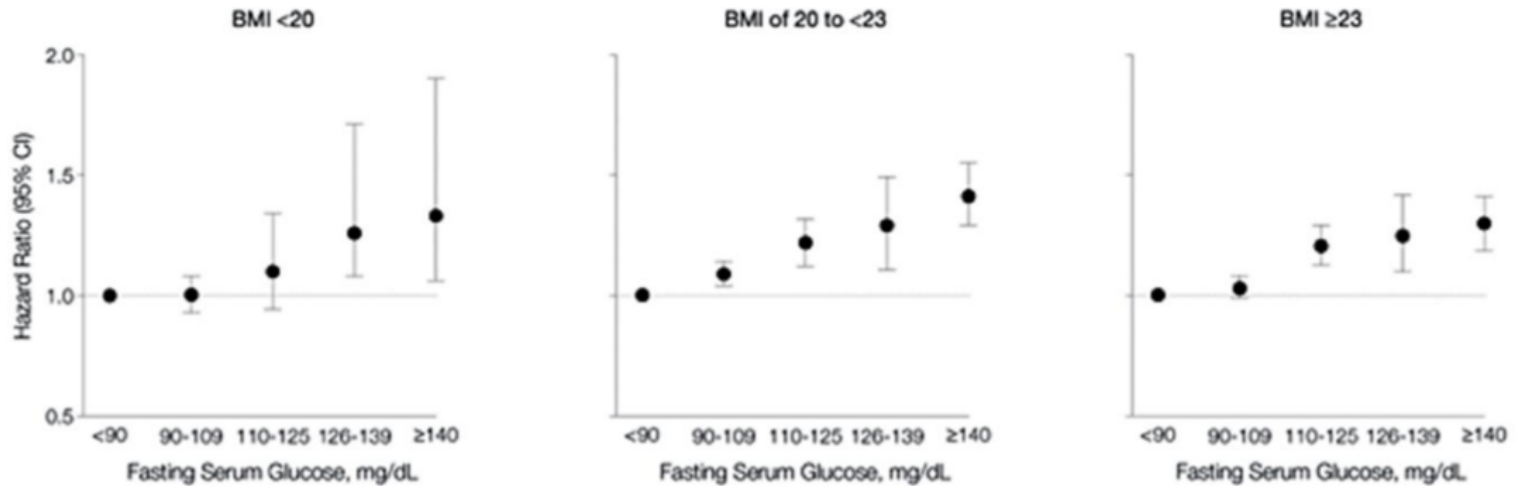
Bozulmuş Glukoz Toleransı Kanser İlişkisi

Increased risk at higher glucose levels

Table 2. Age-Adjusted Mortality Rate per 100 000 Men for Death Due to All Causes, All Cancers, and Various Cancers by Fasting Serum Glucose Level in Korean Men, 1993-2002*

Type of Cancer	Fasting Serum Glucose Level, mg/dL†					P Value for Trend	Diabetes (n = 41 868)‡
	<90 (n = 429 370)	90-109 (n = 304 362)	110-125 (n = 58 020)	126-139 (n = 11 459)	≥140 (n = 26 559)		
All causes							
Death rate§	677.3	697.7	847.2	1029.2	1371.6		1207.7
HR (95% CI)	1.00	1.04 (1.02-1.06)	1.28 (1.24-1.32)	1.50 (1.42-1.58)	2.09 (2.03-2.16)	.01	1.83 (1.79-1.88)
All cancer							
Death rate§	266.0	270.9	303.7	334.5	341.0		333.0
HR (95% CI)	1.00	1.04 (1.01-1.07)	1.17 (1.11-1.23)	1.25 (1.14-1.36)	1.29 (1.22-1.37)	.003	1.27 (1.22-1.33)

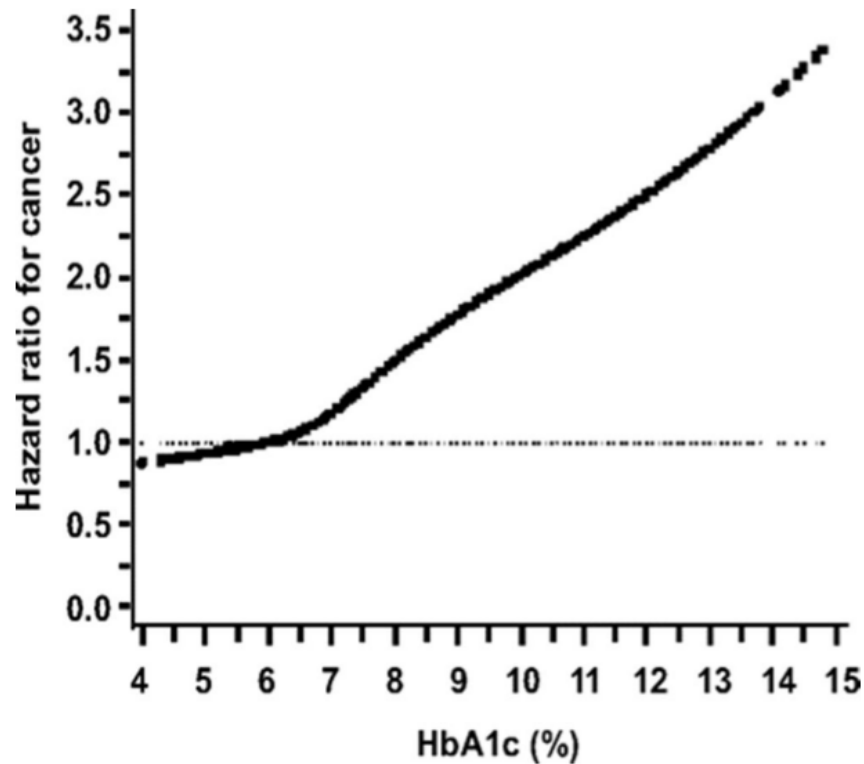
Bozulmuş Glukoz Toleransı Kanser İlişkisi



Bozulmuş Glukoz Toleransı BMI bağımsız faktör olarak kanser ile ilişkili

Diabet ve Kanser İlişkisi

Risk of cancer and HbA1c



Bozulmuş Glukoz Toleransı Kanseri İlişkisi

Association of Insulin Resistance and Site-Specific Cancer Incidence

	Association With Specific Categories of Malignancy		
	Increased Incidence within Malignancy Category	Decreased Incidence or No Effect	Controversial or Unknown
Non-Insulin Dependent Diabetes Mellitus (Type 2 DM)	Esophageal Colorectal Pancreatic Hepatocellular Carcinoma Renal Carcinoma Breast Endometrial Urinary System	Prostate Lung Ovarian	Lymphoma Acute & Chronic Leukemia Bone Sarcomas Soft Tissue Sarcomas Thyroid Brain Skin
Metabolic Syndrome (MetS)	Pancreatic Hepatocellular Carcinoma Breast Endometrial Cervical	Lung Ovarian Brain Skin Thyroid	Lymphoma Acute & Chronic Leukemia Bone Sarcoma Soft Tissue Sarcoma Prostate Urinary System

Etan O, Curr Diab Rep 2013

Diabet ve Kanser İlişkisi

Insulin Signalling

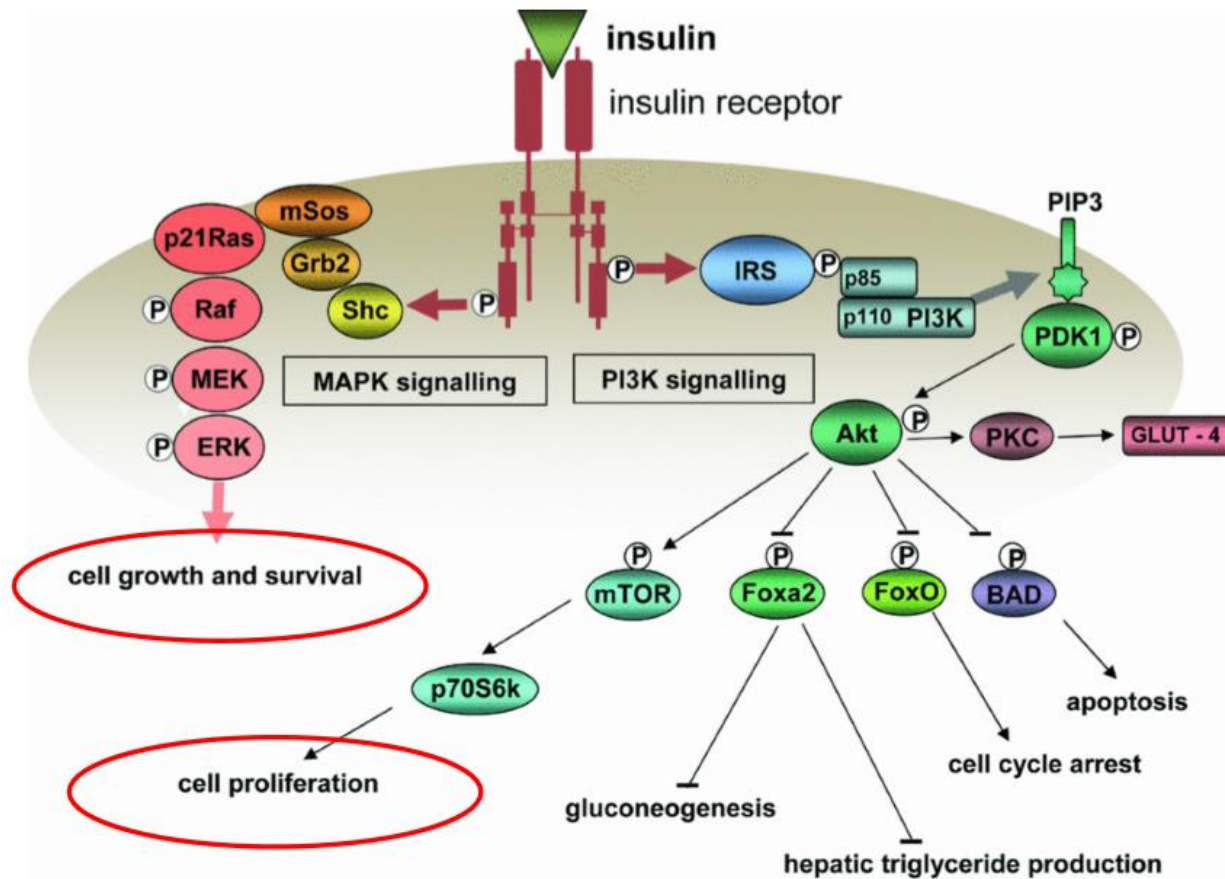


Table 2 | **Associations of obesity with selected hormones and proteins**

Hormone or binding globulin	Obesity versus normal weight
Insulin	Increased levels with obesity
IGF1	Non-linear relation, with peak levels in people with BMIs of 24–27 kg/m ²
Free IGF1	Increased levels with obesity
IGFBP1	Decreased levels with obesity
IGFBP3	Increased levels with obesity or no observed effect
SHBG	Decreased levels with obesity
Total testosterone	Decreased levels with obesity (men); no observed effect (women); increased levels with obesity (premenopausal women with polycystic ovary syndrome)
Free testosterone	No observed effect or decreased levels with obesity (men); increased levels with obesity (women)
Total oestradiol	Increased levels with obesity (men and postmenopausal women); no observed effect (premenopausal women)
Free oestradiol	Increased levels with obesity (men and postmenopausal women); no observed effect (premenopausal women)
Progesterone	No observed effect or decreased levels with obesity in women with a susceptibility to develop ovarian hyperandrogenism (premenopausal women only)

BMI, body mass index; IGF1, insulin-like growth factor 1; IGFBP, IGF-binding protein; SHBG, sex-hormone-binding globulin.

Obesity and Diabetes: The Increased Risk of Cancer and Cancer-Related Mortality
Diabetes Risk Relative to No Diabetes (Men)

Cause of Death	Age-adjusted RR (95% CI)	Multivariable-adjusted RR (95% CI)*
Oral cavity of pharynx	1.39 (1.04–1.87)	1.44 (1.07–1.94)
Colon	1.21 (1.08–1.35)	1.15 (1.03–1.29)
Liver or intrahepatic bile duct	2.40 (2.02–2.86)	2.26 (1.89–2.70)
Pancreas	1.42 (1.25–1.61)	1.40 (1.23–1.59)
Bladder	1.23 (1.02–1.48)	1.22 (1.01–1.47)
Breast	4.37 (2.32–8.24)	4.20 (2.20–8.04)
Prostate	0.89 (0.80–0.98)	0.88 (0.79–0.97)

No significant difference in RR was found for cancer of the esophagus, rectum or anus, gallbladder or extrahepatic bile duct, larynx, lung, bronchus or trachea, connective tissue, other skin, melanoma, kidney or other urinary organs, brain or nervous system, lymphoma, multiple myeloma, and leukemia.

*Adjusted for age, education, BMI, smoking, alcohol intake, vegetable intake, red meat intake, physical activity, and aspirin use. [Data from the Cancer Prevention II Study (28).]

Sedanter Yaşam ve Kanser İlişkisi

Sedentary Behavior: Is Sitting the New Smoking?

In recent years, sedentary behavior has emerged as a risk factor for disease that is distinct from and independent of leisure-time physical activity. Sedentary behavior is linked with diabetes, obesity, and cardiovascular disease; it can also increase the risk of certain cancers, most notably colorectal and endometrial ([Washington Post Infographic 2014—pdf, 31.5 MB](#)), ([Text-only version of Washington Post Infographic—pdf, 54KB](#)). New insights about the adverse health effects of sitting have helped us understand some of the limitations of the prevailing strategy, regular exercise, to reduce these risks, as well as opportunities to augment this strategy. DCEG investigators have helped define the magnitude of the problem, quantify the health risks associated with sedentary behaviors, and describe the risks associated with reducing sedentary time.

“The average adult spends more than half their day sitting or in sedentary behaviors,” Dr. Matthews said. “We’re learning that exercise alone may not be enough to reduce the risk of cancer and other diseases.”

Using data from the NIH-AARP Diet and Health Study, Dr. Matthews and colleagues found that higher amounts of sitting time and television viewing were associated with mortality, even after adjustment for exercise participation ([Matthews et al., 2012](#)). Dr. Matthews takes this message to heart; he is often seen standing in seminars or walking on the tread-desk in his office.

DCEG investigators are also curious about the tradeoffs between sedentary behavior and physical activity. Dr. Matthews and colleagues recently estimated the mortality benefits associated with reducing sedentary time by an hour and replacing with different types of physical activity ([Matthews et al., 2015](#)).

“We found that replacing sitting time with any type of activity was beneficial for less active adults,” Dr. Matthews said. “For more active adults, mortality was only lower for those who replaced sitting time with purposeful exercise.” DCEG fellow Sarah Keadle, Ph.D., M.P.H., is examining television viewing as a modifiable risk factor.



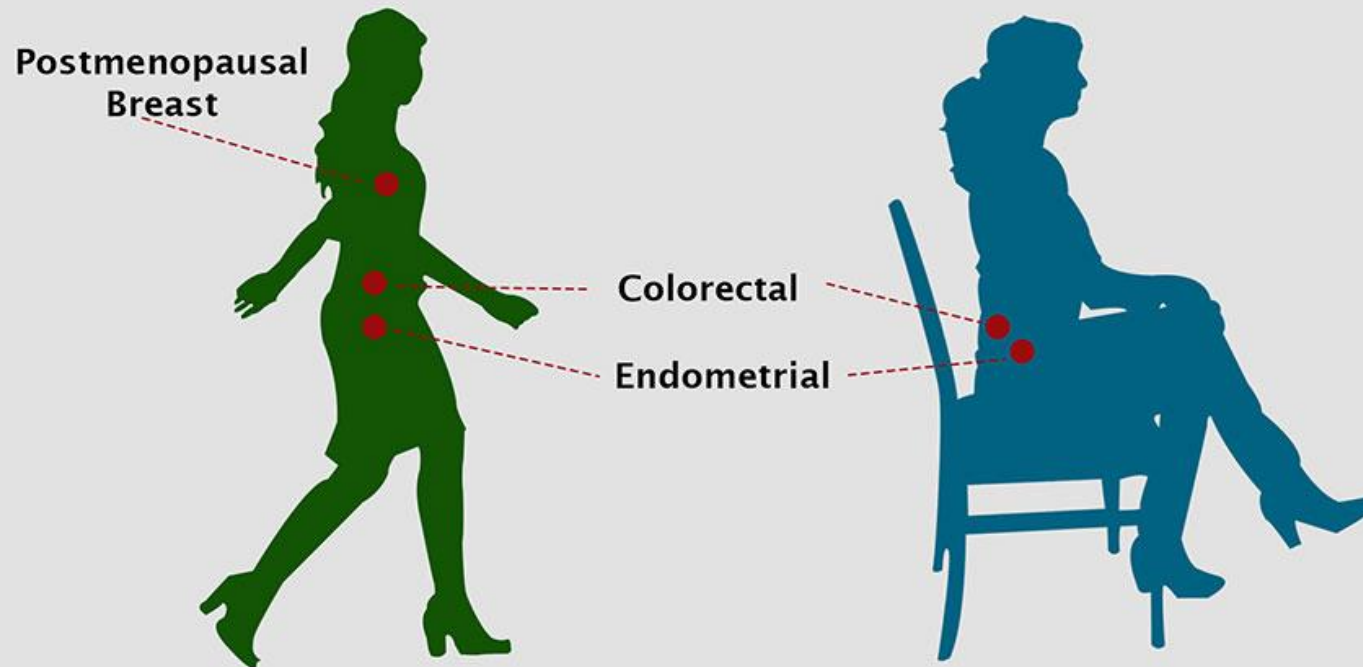
Charles Matthews working at his tread-desk

Sedanter Yaşam ve Kanser İlişkisi

THERE IS A STRONG ASSOCIATION

between **physical activity** and a decreased risk of these cancers:

between **sedentary behavior** and an increased risk of these cancers:



Egzersiz ve Vücut ağırlığının korunması

- ❑ The World Cancer Research Fund tahminine göre;
- ❑ Amerikalıların yaklaşık %20 aşırı kilo, sedanter yaşam(egzersiz yapmama) ve alkol tüketimine ve sağlıklı olmayan beslenmeye bağlı olarak kanser olmakta ve bu sebepten ölmektedir.
- ❑ Vücut ağırlığının korunması, kas kütle oranının artırılması, düzenli egzersiz ve alkol tüketiminin sınırlandırılmasıyla, başta kanser olmak üzere diğer önemli ölüm nedeni olan kardiyovasküler hastalıkların önlenmesi önemli bir oranda mümkündür.

Fiziksel Aktivite ve Egzersiz

☐ Düzenli fiziksel aktivite ile;

Meme

Kolon

Endometrium

Prostat kanserlerinin riski azalmaktadır.

☐ Diğer kanser türleri için yapılmış büyük çalışmalar olmasa da yararlı olduğu tartışılmaz.

☐ Vücut kas kitlesinin artması ve yağ oranının artmasıyla , hipertansiyon, diyabet, osteoporoz ve kalp hastalıklarında da önemli oranda düşüş izlenmektedir.

Fiziksel Aktivite ve Egzersiz

Aktiviteler normal aktiviteler ve kasıtlı aktiviteler olarak ikiye ayrılır.

Normal

- Rutin aktivitelerdir
- Merdiven çıkma
- Otoparktan ofise kadar yürüme
- Giyinme
- Odalar arasında yürümeler

Kasıtlı aktiviteler;

- Rutinin dışında planlanarak yapılan aktivitelerdir.
- Bisiklete binme
- Tempolu yürüyüş veya koşu
- Egzersiz seanslar
- Rutin olayların aktivitesini artırmak
- Otobüs yerine bisiklet kullanmak veya otobüsten iki durak önce inmek gibi

Fiziksel Aktivite ve Egzersiz

- Yetişkinler → haftada 150 dk orta aktivite veya 75 dk ağır aktivite
- Çocuk ve gençler → hergün 1 saat orta veya şiddetli aktivite yapmalılar ve şiddetli aktivite yapılan günler haftada en az 3 gün olmalı
- Günlük en az 20-30 dakika aktif olunmalıdır.

Fiziksel Aktivite ve Egzersiz

- ❑ Ek hastalığının olması, yaş ve benzeri faktörler egzersiz seçiminde etkilidir.
- ❑ Aktiviteler şiddetlerine göre hafif, orta ve yoğun olarak üçe ayrılır.
 - Hafif aktivite; alışveriş, ev işleri ve bahçe işleri vb.
 - Orta aktivite; daha yorucu aktivitelerdir. Yürüyüş gibi.
 - Ağır aktivite; büyük kas gruplarının kullanıldığı ve daha fazla kalp hızı daha derin ve hızlı solunum ve terleme ile sonuçlanır.

SONUÇ

OBEZİTE

DİABET

KANSER

SEDANter
YAŞAM

