California Food Guide

Body Weight

By Sharon B. Sugerman, M.S., R.D., F.A.D.A. and Amy C. Fong, B.S.

What's New

- State-level prevalence of obesity in adults, based on self-reported weight and height, increased significantly between 1995 and 2005, moving states farther away from the Healthy People 2010 target of 15% prevalence for obesity.[1]
- California spends an estimated $6.4 billion on health costs due to obesity and an additional $2.0 billion due to overweight each year, split about evenly between direct and indirect costs.[2]

Public Health Implications

Obesity has been designated as a "national epidemic," and, as Table 1 shows, prevalence has risen rapidly over the past two decades, especially during the 1990's.[3, 4]

In 2003-2004, approximately 66 percent of the United States adult population aged 20 years or older was categorized as measured overweight or obese,[5] while 22 percent were self-reported as overweight and obese.[6] The prevalence of overweight among children and adolescents in the U.S. has tripled since 1980. An estimated 19 percent of 6-11 year olds and 17 percent of 12-19 year olds in the U.S. were overweight in 2003-2004.[5] California has not been spared. In California, 60.2 percent of those age 18 and older were overweight or obese and 22.5 percent were obese by self-report in 2005.[7] In contrast, about two percent of Americans[8] and Californians[7] were underweight.

Healthy People 2010 Goals[9]

The United States Department of Health and Human Services (USDHHS) major goals related to improving health through decreasing the prevalence and consequences of overweight, obesity, and eating disorders are:

- Increase the proportion of adults over age 20 that are at a healthy body weight from 42[†] to 60 percent[§].
- Reduce the proportion of adults who are obese from 23[†] to 15[§] percent.

[†] At the time baseline data was established for Healthy People 2010 goals.
[§] By 2010

- Reduce the proportion of children and adolescents who are overweight or obese to 5[§] percent from 11[†] percent.
- Increase the proportion of worksites that offer nutrition education and/or weight management programs for employees from 55[†] to at least 85[§] percent for worksites employing more than 50 people.
- Increase the proportion of primary care providers who provide counseling or education related to diet and nutrition from 42[†] to 75[§] percent for patients with cardiovascular disease, hyperlipidemia, and diabetes diagnoses.

Reduce the relapse rates for persons with eating disorders including anorexia nervosa and bulimia nervosa (no targets given).

Table 1: California Obesity Trends Among U.S. Adults; BRFSS,* 1984-2005[4]

Year	Percentage of Californian Adults
1984	8.6%
1985	7.6%
1986	8.1%
1987	9.2%
1988	11.7%
1989	10.0%
1990	11.0%
1991	11.3%
1992	12.8%
1993	13.5%
1994	14.8%
1995	15.2%
1996	15.0%
1997	16.4%
1998	17.6%
1999	18.8%
2000	19.7%
2001	21.2%
2002	19.5%
2003	23.0%
2004	22.2%
2005	22.6%

*** Behavioral Risk Factor Surveillance System**

Definition

Please be reminded that this body weight chapter was written from a public health perspective and should not be regarded as a medical perspective.

Overweight and Obesity in Adults

Overweight and obesity refer to a gradient of a condition in which a person's body weight and proportion of the body fat potentially impair health. Body mass index (BMI) and waist circumference are both used to assess body fat and are predictors of risk for diseases related to obesity. BMI is used to identify obesity on a population basis. BMI is calculated using the following equation:

$$\frac{\text{weight (kilograms)}}{\text{height}^2\text{ (meters)}} \quad \text{or} \quad \frac{\text{weight (pounds)}}{\text{height}^2\text{ (inches)}} \times 704.5$$

The most recent adult body weight standards based on BMI from the National Heart, Lung, and Blood Institute are presented in Table 2, with a BMI $\geq$ 30 kg/m^2 defined as obesity and a BMI $\geq$ 25 kg/m^2 and $\leq$ 30 kg/m^2 defined as overweight.[10]

Table 2: Weight Classification by BMI, Waist Circumference, and Associated Disease Risk*

Body Weight Category by BMI Status	BMI (kg/m^2)	Disease Risk** Relative to BMI Status and Waist Circumference	
		Not-at-risk waist circumference	At-risk waist circumference
		Men $\leq$ 40 inches ($\leq$102 cm) Women $\leq$ 35 inches ($\leq$ 88 cm)	Men > 40 inches (>102 cm) Women > 35 inches (> 88 cm)
Underweight	<18.5	--	--
Normal	18.5-24.9	--	***
Overweight	25.0-29.9	Increased	High
Obesity, Class I	30.0-34.9	High	Very High
Obesity, Class II	35.0-39.9	Very High	Very High
Extreme Obesity, Class III	$\geq$ 40	Extremely High	Extremely High

* Adapted from National Institutes of Health, National Heart, Lung, and Blood Institute, The Practical Guide: Identification, Evaluation and Treatment of Overweight and Obesity In Adults. Table 2, p. 10. 2000.

for Type 2 Diabetes, Hypertension, and Cardiovascular Disease

*** Waist circumference may increase risk for chronic disease even in normal weight individuals.

The chart presented in Table 3 (following page) can be used to determine BMI for adults using body weight (pounds) and height (inches). Between 1991 and 2001, nationwide, the proportion of adults defined as obese increased from 12 percent to 20.9 percent.[11]

Body fat distribution is an independent risk factor for chronic disease. It is important to remember that BMI correlates with the amount of body fat but does not directly measure body fat. As a result, some people, such as athletes, may have a BMI that identifies them as overweight even though they do not have excess body fat.

Table 3: Determining Body Mass Index (BMI) for Adults

To use the table, find the appropriate height in the left-hand column labeled Height. Move across to a given weight (in pounds). The number at the top of the column is the BMI at that height and weight. Pounds have been rounded off.

BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	40	45	50
Height (inches)	**Body Weight (pounds)**																			
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167	191	215	239
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	198	222	247
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	204	230	255
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	211	238	264
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	218	246	273
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	225	254	282
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	232	262	291
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	240	270	300
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	247	278	309
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223	255	287	319
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	262	295	328
69	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

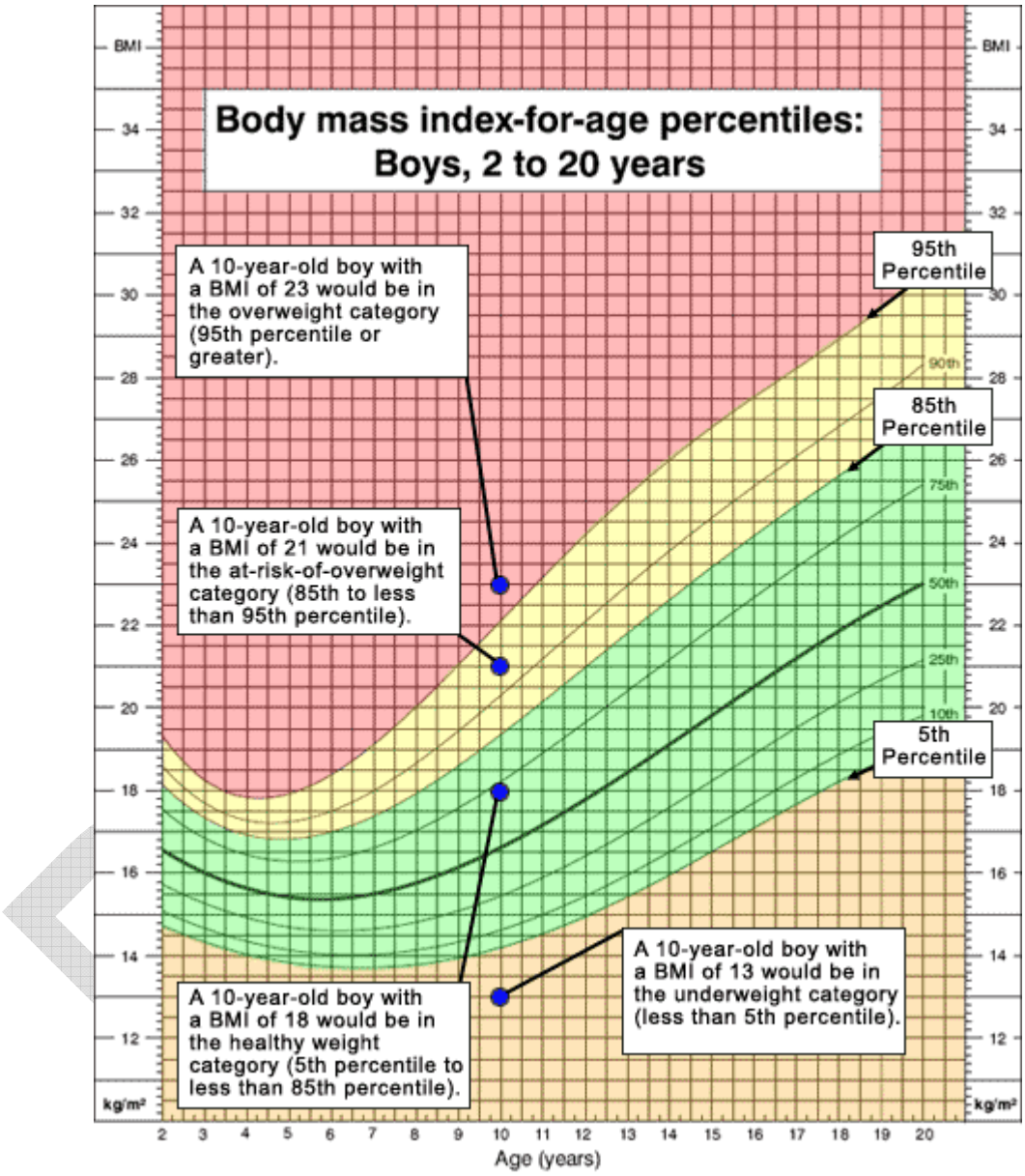
Elevated waist circumference is a measure of central body fat. It is defined as > 40 in. (> 102 cm) for men and > 35 in. (> 88 cm) for women and can be a marker of metabolic syndrome, in both men and in older men and women.[12, 13, 14] Metabolic syndrome is a combination of disorders that is associated with elevated risk for the obesity-related chronic diseases, diabetes, and cardiovascular disease. Besides abdominal obesity, it is characterized by high triglycerides, high low-density lipoprotein (LDL) cholesterol, insulin resistance or glucose intolerance, elevated blood pressure, elevated high-sensitivity C-reactive protein in the blood, and high fibrinogen or plasminogen activator inhibitor [–1] in the blood.[15] Little literature exists about prevalence of high waist circumference among the general population. One Canadian study that used 90 cm or more as its definition of high waist circumference found a prevalence of about 20 percent in among 907 men who had participated in the Quebec Health Survey.[12] Based on pre-defined "action levels," in a study of 20-59 year olds from the Netherlands, larger waist circumference identified people at increased cardiovascular risks.[16]

- Both overweight and central fat distribution relate to preventable ill health.
- Compared with people with waist circumferences below "action level" 1 (94 cm in men, 80 cm in women) those with waist circumferences between action levels 1 and 2 (94-101 cm in men, 80-87 cm in women) are one and a half times to twice as likely to have one or more major cardiovascular risk factors; people with waist circumferences above action level 2 are two and a half to four and a half times as likely to have one or more major cardiovascular risk factors.
- A waist circumference above action level 1 should be a signal to avoid weight gain or lose weight, to maintain increased physical activity, and to give up smoking in order to reduce the risk of cardiovascular disease.
- Patients with a waist circumference above action level 2 should seek advice from health professionals for weight management.

Overweight and Obesity in Children and Adolescents

During childhood growth and development, it has been suggested that the term "obese" not be used. However, excess weight in childhood and adolescence is an important risk factor for obesity in adulthood.[17] Additionally, it can bring serious health burdens to children, including hypertension, high cholesterol, glucose intolerance, and psychosocial problems.[18, 19] "Overweight" is defined as $\geq$ the 95th percentile of BMI based on the 2000 U.S. Growth Charts specific to gender and age (also called "BMI for Age"). "At-risk for overweight" among children and adolescents aged 2-19 years is defined as having a BMI for age that falls into the sex-specific 85th up to 95th percentile category.[20, 21]

The example that follows demonstrates how to interpret BMI for a ten-year-old boy.[21] The CDC BMI-for-age and other growth charts for boys and girls ages 2-20, as well as various growth charts for boys and girls ages birth to 36 months are available at: http://www.cdc.gov/nchs/about/major/nhanes/growthcharts/charts.htm#Summary[20]



Under the growth chart definition, an estimated 19 percent of 6-11 year olds and 17 percent of 12-19 year olds in the U.S. were overweight in 2003-2004.[5] California teens and children also report high rates of overweight. The 2002 California Teen Eating, Exercise and Nutrition Survey (CalTEENS) found 9 percent of teens self-reported overweight and another 15 percent self-reported reported at-risk for overweight.[22] In 2000, more than one third of all California adolescents surveyed reported having tried to

lose weight, most frequently by exercise, but also by dieting, fasting and smoking.[23] The parents of children age 9-11 years also proxy self-reported high prevalence of overweight and at-risk for overweight. Among those taking part in the 2003 California Children's Healthy Eating and Exercise Practices Survey (CalCHEEPS), over one-third (38 percent) were overweight or at risk for overweight.[24] It is worth noting that children who reported having a lesson in nutrition during the past school year were significantly less likely to be at-risk than other children.

Even very young children are experiencing a problem with excess body weight, with one survey finding nearly 14 percent of low-income children under two as overweight.[25] Among 2-5 year old children, the prevalence of overweight was nearly 15 percent among a national sample of low-income children[26] and 14 percent among a national sample of children of various income levels.[5] California's youngest children have measured obesity rates even higher than the national average, with 17.5 percent of 2- 5 year olds having a BMI $\geq$ the 95th percentile.[27] This is over triple the expected rate of five percent.

Underweight in All Age Groups

A BMI < 18.5 is considered underweight for adults. For teens and children, underweight is defined as a BMI < 5th percentile for gender and age. Rates of underweight are very low. Only two percent of California adults are underweight according to the 2003 California Health Interview Survey (CHIS).[28] Information about teen and child underweight is scarce, except for low-income children. For low-income California children, 5.3 percent of children younger than five years old were measured as underweight (< the 5th percentile), while this was true for only 2.6 percent of youth age 5-20 years old.[27] Based on the definition used, five percent of children would be expected to be classified as underweight.

Both anorexia nervosa and bulimia nervosa are eating disorders that are related to weight loss and weight gain, respectively. They are not primarily a nutritional problem, but rather are mental health disorders. Anorexia nervosa in particular is an extreme form of underweight, characterized by self-starvation, excessive weight loss and body image distortion.[29] The National Eating Disorders Association (NEDA) estimated that eating disorders such as anorexia nervosa and bulimia nervosa affect nearly ten million females and one million males in the United States.[30]

On the other hand, bulimia nervosa is more easily hidden. Bulimia nervosa is characterized by routine, secretive, binge eating followed by compensatory behaviors to rid the body of the large amounts of food eaten.[29] Individuals suffering from bulimia may be able to hide the disorder from others for years because they maintain normal or above normal body weight. It has been estimated that as many as one to three percent of adolescents are bulimic.[31]

Disparities

Adults - Race/Ethnicity, Poverty, Income, and Education

Substantial socio-demographic disparities exist in obesity among adults. Although, among the four most populous race/ethnic groups, the highest levels of obesity were seen among African American and Hispanic individuals, nationally no significant differences between race/ethnic groups among men were observed.[11] Conversely, compared to non-Hispanic white women, Mexican American and non-Hispanic black women were significantly more likely to be obese. In 2003-2004, nearly 58 percent of non-Hispanic black women aged 40-59 years were obese (BMI of 30 or higher) in contrast to 38 percent of non-Hispanic white women of the same age group.[5] It is worth noting that recent research suggests universal standards applied to all racial groups may be inappropriate. Use of percent body fat as an obesity measure rather than BMI reduces the gap between African American and white women by half due to higher lean body mass in the African-American women.[32] Among Native American/Alaska Native (NA/AN) men and women, the obesity rate is nearly identical between the genders—23.9 and 23.8, respectively, but much higher than the 181.7 percent mean of both male and female respondents who were not NA/AN.[33]

There has also been debate on whether current BMI cut-off-points accurately reflect overweight and obesity in Asian populations. The concern is that current BMI cut-off points may underestimate health risks associated with obesity in Asian populations.[34] In parts of Asia there is a high prevalence of type 2 diabetes and cardiovascular diseases with BMIs below the World Health Organization (WHO) cut-off point of > 25 kg/m^2 for overweight (WHO defines obese as > 30 kg/m^2). Evidence suggests Asian populations have different associations between BMI, percent of body fat and health risks than European populations.[35] The disparities among obesity in adults are evident when adjusting for age. Older adults (40-79 years old) are more likely to be obese than younger adults (20-39 years old), however there is debate about whether the same criteria as it relates to health risk is appropriate for the elderly.[36, 37]

Poverty is another factor in which obesity disparities are apparent. Women with income below 130 percent Federal Poverty Level (FPL) are about 50 percent more likely to be obese than those with higher income (greater than 130 percent FPL).[8] Several studies have documented an association between food insecurity and overweight particularly for low-income women—less so for men.[38, 39]

However, while lower income individuals have greater obesity levels than higher income people[40] concern about increasing prevalence of overweight among affluent individuals has also been raised. According to a study using data collected from the National Health and Nutrition Examination Survey, in the past 30 years obesity prevalence among the highest income group (>$60,000) has increased three times faster than the lowest income group (<$25,000).[41] Lack of education is a factor related to disparity also, with the highest obesity rates among those with less than a high school education.[11]

An increased prevalence of overweight affects some groups of Californian adults at disparate rates as well (Table 4). Most men, African American and Latino people, those older than 24 years of age and persons with a high school education or less are at greatest risk. In particular, African American and Latino men exhibit the highest rates of overweight, 75 percent and 76 percent, respectively. Nearly 73 percent of adults with less than high school education are overweight compared to 55 percent of adults with some or more college.[42]

Table 4: Prevalence and Trends in Overweight,‡ California Adults Age 18 and Older[4]

Population	Prevalence Percent 1984	1994	2004	Percent Change Since 1984	Since 1994
Total	40	50	60	+50	+20
Gender					
Men	51	59	68	+33	+15
Women	30	42	52	+73	+24
Ethnicity					
White	38	48	55	+45	+15
African-American	46	59	70	+52	+19
Latino	48	60	71	+48	+18
Asian/Other@	27	31	42	+56	+35
Education					
Less than high school	53	62	73	+38	+18
High school graduate	39	51	64	+64	+25
Some or more college	36	46	55	+28	+20
Income					
Less than $20,000		54	64	n/a	+19
$20,000 – <$35,000		50	66	n/a	+32
$35,000 - < $50,000		51	60	n/a	+18
More than $50,000		49	56	n/a	+14
Age					
18-24	20	32	45	+125	+41
25-34	36	44	59	+64	+34
35-44	48	59	65	+35	+10
45-54	45	59	64	+42	+8
55-64	43	60	64	+49	+7
65+	45	45	57	+27	+27
Gender by Ethnicity					
Men					
White			62	n/a	n/a
African-American			75	n/a	n/a
Latino			76	n/a	n/a
Asian/Other			62	n/a	n/a
Women					
White			43	n/a	n/a
African-American			63	n/a	n/a
Latino			65	n/a	n/a
Asian/Other			34	n/a	n/a

‡ Overweight is defined as BMI greater than or equal to 25.
Ψ "Other" includes Native American, unknown, and all other responses

Turning to a larger California dataset, which allows the inclusion of over-sampled Native American and Asian respondents, nearly 33 percent of California Asian adults ages 18 and older are either overweight or obese according to 2003 CHIS findings. This figure

is considerably lower when compared to other race/ethnic groups: non-Latino white (53.7 percent), Non-Latino American Indian/Alaska Native (64.0 percent), Latino (65.0 percent) and African American (65.7 percent) Californians, as categorized by CHIS.[28] While the California Asian population reports the lowest rate of obesity, as noted above, it is not clear that the standards as defined should be applied to all ethnic groups.

Children and Adolescents – Race/Ethnicity, Poverty

Nationally, among teenagers, 1999-2004 data shows that nearly 22 percent of African American, 17 percent of White children, and 16 percent of Mexican-American children were overweight.[5] The disparities among overweight California adolescents are evident when looking at differences between gender, race/ethnicity, and income. Based on CalTEENS data, twelve percent of California male adolescents were classified as overweight compared to only five percent of female adolescents, while data from the 2003 CHIS with a larger sample show that nearly 16 percent of male teen respondents, 12-17 years old were overweight compared to almost nine percent of female adolescents.[28] Latino and African American adolescents were at risk for overweight or overweight significantly more than those from other ethnic groups. Nearly 30 percent of African American and Latino teens experienced a higher prevalence of overweight plus at-risk for overweight than other race/ethnic groups.[22] This pattern was also confirmed in the California survey with the larger sample: the highest prevalence of overweight was in Latino and African American adolescents, 17.6 percent and 12.9 percent, respectively. Income-related, teens living in poor households (below 100 percent FPL) are more likely to be overweight or obese than those from households 300 percent FPL and above (18 and 9 percent, respectively).[28]

Among a national sample of low-income children, both Hispanic and American Indian/Alaskan Native prevalence rates were above 18 percent.[25] In California, of particular alarm is the change among low-income Asian children. During the years 1992 to 2004, the rate of overweight increased more rapidly among California Asian children age 5-20 years old than in any other race/ethnic group.[27]

In a more representative sample of California children, those at greatest risk for overweight plus obesity were boys (41 percent), children from lower-income households of $\leq$ $19,999 (47 percent), and ethnic minorities: African Americans (42 percent), Asian/Other (39 percent), and Latinos (44 percent).[24]

Underweight – Adults, Children, and Teens

Rates of underweight are highest among Asian (5.5 percent) and lowest among Latino Californians (1.3 percent, with little difference among other racial/ethnic groups. Those adults living in households below 200 percent of the Federal Poverty level are more likely to be underweight (2.6 percent) than those living above it (1.9 percent).[28] For low-income California children in the under five age group, Latino children showed the lowest prevalence of underweight (4.6 percent), while most other racial/ethnic groups were above 6 percent. In the 5-20 year old age group, only Asian/Pacific Islander children were noticeably different than other youth, with a 5 percent underweight prevalence compared to 1.9-3.1 percent prevalence for other racial/ethnic groups.[27]

Burden

Obesity is a risk factor for the development of many serious medical conditions. Excess body fat is related to increased risk of coronary heart disease,[43, 44, 45, 46] diabetes,[11, 47] hypertension,[48] gall bladder disease,[49] and stroke.[50] Post-menopausal breast cancer,[51] as well as cancers of the colon, kidney, and lining of the uterus all have increased incidence in obese.[52] Obesity also contributes to other conditions that diminish quality of life, including osteoarthritis,[53] infertility,[54] sleep disruption (apnea),[55] asthma, and other breathing problems.[56, 57] For obese adults, weight loss of 10 percent improves glucose tolerance, hyperlipidemia, and blood pressure.[10]

One indicator of the burden of a condition is its associated cost in death and disease. Since 1993 it has been speculated that, following tobacco; the combination of diet, physical inactivity, and obesity, as a whole, is the second most preventable cause of death.[58, 59, 60] Newer methodology used by Flegal and colleagues disputed that calculation, indicating obesity to be responsible for 112,000 annual deaths which was somewhat offset by a positive effect on mortality among those with a BMI in the 25 to 30 range, for a net effect of only 25,800 deaths attributable to overweight and obesity.[61] This contrasts with the substantially larger number of deaths earlier calculated by the groups of McGinnis (300,000), Allison (280,000) and Mokdad (350,000). On the other hand, there is little doubt that the effect of obesity and, to a lesser extent overweight, is substantial on increasing risk of numerous medical conditions, especially chronic diseases contributing to a notable economic and social burden.[11, 45, 47, 49, 51]

The total economic cost of a disease includes both medical cost and lost productivity. Obesity costs the United States billions of dollars annually. National estimates of the medical expenses related to overweight and obesity put the direct cost at nearly $93 billion per year in 2002 dollars.[62] In California, the total cost for overweight and obesity combined for an estimated $8.4 billion in 2000. Obesity alone contributed approximately $3.4 billion to the total cost in the lost productivity costs of absenteeism, presenteeism,[€] and short-term disability, as well as workers compensation.[63]

In addition, consumers spend over $34 billion per year trying to lose weight or to prevent weight gain. This figure encompasses all types of weight loss and maintenance efforts, including low calorie foods, artificially sweetened products, and books and other publications on dieting. It is estimated between one to almost five billion dollars alone are spent on weight loss programs and supplements annually.[64]

While the number of persons who are so severely underweight that it presents a serious health problem is not nearly as dramatic and there is little economic research, extreme underweight, i.e. anorexia nervosa, does evoke a financial burden. The cost of inpatient treatment can be $30,000 or more per month. Many patients need repeated

[€] Presenteeism is defined as "The problem of workers being on the job but, because of medical conditions, not fully functioning." http://www.medterms.com/script/main/art.asp?articlekey=40516

hospitalizations. The cost of outpatient treatment, including therapy and medical monitoring, can be $100,000 or more.[65]

Trends/Contributing Factors

At the national level, the prevalence of adult obesity increased by 50 percent during the past two decades.[9] In 1991, no states reported more than 20 percent of their population was obese. Thirteen years later in 2004, 42 states have obesity rates of more than 20 percent.[66] The California Behavioral Risk Factor Surveillance System (BRFSS) found self-reported rates of overweight increased over 75 percent for women and 33 percent for men between 1984 and 2004. Besides women, the greatest escalation in California obesity rates occurred in the following population segments: African American (52 percent) and Asian/Other (56 percent) ethnic groups, high school graduates (64 percent), and younger persons, ages 18-24 years old (125 percent) and 25-34 years old (64 percent) (See Table 3).[42]

Trends are similar for adolescents and children. Nationally, between 1988-94 and 1999-2000, obesity escalated 38 percent for boys 6-11 years old, 37 percent for boys 12-19, 32 percent for girls 6-11 years and 60 percent for girls 12-19 years.[67] For low-income younger children, overweight rates for two through four year olds in California increased by nearly 30 percent between 1992 and 2004. Between 1992 and 2004 for California low-income 5 to less than 20 year olds, rates escalated 38 percent for American Indian/Alaska Native, 59 percent for Latino, 73 percent for African American, 76 percent for White and an astonishing 158 percent for Asian/Pacific Islander youth.[27]

Many factors contribute to these alarming trends. Obesity reflects an imbalance of caloric intake and energy expenditure. The interaction between genetic tendencies, an abundant food supply, and low levels of physical activity have produced an environment leading health professionals have labeled "toxic," to denote that it facilitates the development of high rates of obesity.[68, 69] Furthermore there may be a variety of psychosocial factors that contribute to the development or perpetuation of obesity.[70, 71]

Contributing Factors: Food

Americans are eating more than in the past. The average one-day caloric intake in the United States increased by 150 calories a day between 1977-78 and 1994-96.[72, 73] This many excess calories a day would be expected to produce a weight gain of more than 15 pounds a year. Food intake is influenced by portion size, beginning as early as age five, portion size of many foods have been increasing since the 1970s, and consumers now think of the large portion sizes as the norm.[74, 75, 76, 77]

Many of the excess calories come from low nutrient foods, high in sugar and/or fat.[78] The Healthy Eating Index (HEI) is a composite measurement of dietary quality – a high score indicates better dietary quality. A low score on the HEI is positively related to obesity. The highest score possible is 100, a “good” score is anything above 80, and

the average score in the United States is just a little above 60, "needs improvement."[79] Sugary beverages in particular have been associated with obesity and weight gain.[80] In a large, population-based national dietary survey, for the U.S. population as a whole, three food groups – sweets/desserts (12.3 percent), soft drinks (7.1 percent), and alcoholic beverages (4.4 percent) contribute about one quarter of all calories consumed.[78] Three categories of food made up about 30 percent of the calories for one day for 6-11 year olds and over one-third of the calories for 12-17 year olds in 1999-2002:[81]

- Sugary beverages (soda, fruit drinks, punches),
- Sweets (frozen desserts, cakes, sweet rolls, donuts, candy, cookies),
- Chips, and fried foods (fried chicken, French fries).

In California, 73 percent of adolescents reported eating two or more pastries, fried foods, desserts, candy, or soda on the day preceding the interview; 42 percent ate three or more servings of these foods.[23] California children also are not choosing nutritious low calorie foods for snacks. Fruits and vegetables eaten as snacks averaged less than one-half serving per person. In contrast, high calorie, low nutrient snacks, such as soft drinks, fruit drinks, sweet desserts, and fried snack foods averaged to 3.8 servings per day.[82]

Contributing Factors: Inadequate Physical Activity/Screen Time

Concurrently, reported energy expenditure is low for many people – adults, teens, and children. In 2003 only 53 percent of California adults reported engaging in any combination of moderate or vigorous activities for at least 30 minutes each day five or more times per week.[83] Twenty-three percent engaged in no leisure time physical activity at all in the past 30 days in 2005.[7] Only 26 percent of California teens reported getting the recommended daily one hour or more of vigorous activity in 2000. Males (32 percent) and white teens (31 percent) were more likely than females or those from other ethnic groups to meet this goal. Males were more likely to engage in vigorous activity while females were more likely to report doing moderate activities.[23] Children ages 9-11 were doing somewhat better. On the 2003 CalCHEEPS, children reported spending an average of 75 minutes a day on moderate and vigorous physical activities, with 53 percent meeting the 60 minutes or more daily recommendation. Again, boys were active, on average, significantly longer than girls, 103 vs. 78 minutes respectively, with most of the difference occurring in vigorous activity.[24]

People report inadequate levels of physical activity when trying to control their weight, too. On the 2001-2002 NHANES, 51 percent of U.S. adults (N = 2051) tried to control their weight in the previous 12 months, 34 percent of men and 48 percent of women tried to lose weight, while 11 percent and ten percent, respectively, tried only not to gain weight. The top four methods used for weight control were the same for both weight losers and weight maintainers, but the percentages varied: ate less food; exercised; ate less fat; and switched to foods with lower calories. Less than one fourth used the recommended method of combining reduced caloric intake with the Dietary Guidelines

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for Americans 2005 (Dietary Guidelines) recommended higher levels of physical activity.[84, 85]

Time spent in sedentary leisure activity exceeded that spent on physical activity for teens and was virtually the same for children.[23, 24] Excess television watching is associated with body mass index for both adults and for children, as is television watching in the bedroom for young children.[86, 87, 88, 89, 90] California teenagers reported an average of 134 minutes a day spent watching television, watching videos, playing computer games, and playing videos compared to 66 minutes in moderate to vigorous physical activity. African American teens spent almost three hours a day on these pursuits.[23] In the 2003 CalCHEEPS, children age 9-11 years reported spending 90 minutes a day on sedentary leisure activities vs. 90 minutes on "moderate and hard" physical activity. African American children and children from very low-income households spent 1 ¾ to over two hours engaged in these sedentary pursuits.[24]

Contributing Factors: Lack of Economic Resources

There has been speculation that federal food assistance programs may contribute to obesity, but the evidence suggests this is not the case. For women, the association between participation in the Food Stamp Program and obesity that was observed between 1976-80 and 1988-94 leveled off entirely by 1999-2002. During this time period the association continued to rise steeply among eligible non-participants and low/moderate income women, both whose rates exceeded those of participants by 1999-2002. Obesity also continued to increase sharply among moderate/high income women. For men, findings were moving in the opposite direction. Little association was shown for children, with one major exception. Mexican American boys showed a strong positive association between food stamp participation and BMI/overweight.[91] On the other hand, there is mixed evidence about a positive relationship between food insecurity and obesity.[39, 92] Food insecurity may be a contributing factor to obesity for several reasons. Mechanisms that have been suggested include the need to stretch food dollars to maximize calories, poor food choices as a coping strategy to sacrifice food quality before quantity, overeating when food is available, and physiological changes, i.e., the body compensates for periodic shortages by becoming more efficient at storing calories as fat.[91]

Contributing Factors – Environmental Issues

Urban sprawl and other neighborhood-related elements are environmental factors that are associated with the prevalence of obesity. This "sprawling" neighborhood design encourages sedentary lifestyles as there are limited opportunities for physical activity. Findings from an ecological study examining the relationship between urban sprawl, health and health-related behaviors revealed a small but significant association with minutes walked, obesity, BMI, and hypertension among those living in sprawling counties than those living in compact counties. Compared to residents living in compact counties, those living in sprawling counties walked less, weighed more and had higher prevalence of hypertension.[93] Time spent in a car is associated with obesity as is low levels of mixed land use area, e.g., neighborhood is mostly residential.[94] Both

race/ethnicity and socioeconomic status are strongly related to excess weight (See Disparities section). Research demonstrates less access to physical activity facilities in low income and minority neighborhoods. This, in turn, is associated with higher rates of teen overweight and diminished likelihood of achieving fives days/week or more of moderate-to-vigorous physical activity.[95]

Contributing Factors –Psychosocial Factors

Psychosocial factors such as income level, adverse childhood events, and certain psychiatric diagnoses can lead to an increased risk for obesity. One in four persons seeing a primary care physician about weight problems has an active psychiatric illness, usually depression.[96] There is also a relationship between exposures to abuse or household dysfunction with risk factors such as smoking, severe obesity, physical inactivity, depressed mood, and suicide attempts as the frequency of adverse childhood events increase.[97] It has been proposed that stress and psychosocial problems may affect the endocrine system leading to metabolic abnormalities that increase the risk for obesity.[98] Some feel that it is important for those treating obesity to assess for these possible contributors and refer clients to the appropriate treatment programs. For some, it may be more important to first address these underlying psychosocial issues before any formal weight loss programs are attempted.[70] It is beyond the scope of this chapter to go into the specific treatment modalities.

Contributing Factors – Societal Norms

Even in a time period in which over 65 percent of Americans are overweight, the entertainment and fashion industries perpetuate a cultural norm in which beauty requires a trim figure and beauty may be more highly regarded than more productive characteristics. Young women, in particular, may have false expectations of what their bodies should or can look like and may have distorted pictures of their personal appearance. A person's perception of body weight may affect feelings about oneself and may consequently have impact upon behavior regarding body weight – such as dieting to extremes, purging, and binge eating. Findings from the 2000 California Women's Health Survey revealed that nearly 64 percent of women responded "Yes" to whether perceived body weight affected how they felt about themselves. In 2002, 50 percent of all women *mistakenly* perceived themselves to be overweight. In fact, nearly 40 percent of women with a body mass index less than 18.5 (underweight) and 17 percent of women who were at a healthy weight classified themselves as overweight. These results suggest that many women may be at risk of misperceptions that could have negative consequences on their behavior and increase risk of eating disorders.[99]

The negative views society has on obesity and the social pressures to be thin may lead Californians to feel more self-conscious about their weight. According to the 2003 CDPS, 45 percent of California adults tried to lose weight.[84] The 2000 California Teen Eating, Exercise and Nutrition Survey (CalTEENS) revealed that 36 percent of adolescent respondents reported they tried to lose weight in the past 30 days, with15 percent of adolescents reported going on a diet, fasting and smoking as practices they

had used to lose weight. This figure is likely to be under-reported due to social desirability. Female adolescents were significantly more likely to report going on a diet, fasting and smoking as a method to lose weight compared to male adolescents (22 vs. five percent, respectively).[23]

As a leading channel that exposes us widely to one another's world, television can be a powerful barrier to an appropriate perception of body size and weight status. In a major study examining the impact of the introduction of television in two towns in the Pacific islands of Fiji, dieting became so commonplace that in 1998, 69% of those studied said they had gone on diets to lose weight and 74% said they thought they were "too big or fat." The study showed that girls living in houses with a television set were three times more likely to show symptoms of eating disorders.[100]

Contributing Factors – Perinatal (See also chapters on Prenatal Nutrition and on Maternal Nutrition During Lactation)

Factors occurring during the perinatal period may also contribute to overweight and obesity as a person gets older. During pregnancy, diabetes that is not controlled and, possibly, high birth weight are potential contributors; low birth weight is another likely risk factor.[101, 102, 103] After pregnancy, not breastfeeding may be associated with later higher body weight status.[104]

Barriers to Implementation/Myths

Societal, Systems, Policy, and Environmental Barriers

Multiple environmental changes have contributed to the present epidemic and act as barriers to arresting it. The most desirable method of achieving and maintaining a healthy weight is to balance eating nutritious foods with adequate exercise.[85] Factors that encourage people to eat both more food and less healthy food include availability of more food and calorie-dense foods, the growth of the fast food industry with a concurrent escalation in serving sizes at little extra cost, and the increased availability and marketing of snack foods. In addition, another barrier is increased time for socializing in environments that associate socializing with eating and drinking.[105] Major societal changes in role responsibilities, conflicting information on what is healthy, and demands for time that detract from healthy eating and adequate physical activity add yet more challenges to obesity prevention and reversal.

Barrier: Family Structure

An increase in single-parent households and households with two working parents may result in less time for food shopping and meal preparation than in the past, leading to a greater reliance on ready-to-eat and fast foods. It also may result in more children meeting their own food needs. In California, nearly one-third of children age 9-11 years old reported having the responsibility of preparing their own breakfast and evening snacks and over 50 percent having the responsibility for preparing their own after-school snacks.[106]

Barrier – Food Marketing

New food products are introduced to the public at an ever-increasing rate and disproportionate amounts of advertising dollars are spent promoting unhealthy foods. Americans are inundated with advertising by the food industry. In 1997, food manufacturers spent more than $7 billion on food advertising. Over 75 percent of the $7 billion was spent on television advertising; potentially increasing the negative impact high levels of television viewing has on weight status. Less than 3 percent was spent advertising fruits and vegetables, while more than 32 percent went to promote foods like candy, cookies, salty snack foods, soft drinks (including bottled water), and baked goods. An additional $3 billion was spent advertising eating and drinking establishments, with fast food promotion predominating.[107] The marketing of low nutrition, high calorie food is particularly egregious towards young children who lack the skills to analyze the claims of food ads. A study of Saturday morning children's television advertising found that about 55 percent of the ads were for foods like candy, soft drinks, sweets, chips, and fast foods.[108] Another study found that each year a typical child aged 6-11 years could be exposed to 11,000 food advertisement, with nutrient-poor, high-sugar food advertisements aimed at children. Candy, sweets, soft drinks and convenience/fast foods were the most frequently advertised, comprising 83 percent of all advertised foods.[109]

Barrier – Out of Home Eating

The percentage of meals eaten out of the home and of calories consumed from those meals is increasing in the United States, with fast food the most common source.[110] Frequency of eating out is positively related to body fat for men, women and children, and there is consumption of more calories for several reasons.[111, 112, 113] Restaurant food tends to be higher in fat and lower in fiber than home food, i.e., higher in energy density.[114] Restaurant portions are often large, food is prepared with the aim of being highly palatable, meals offer increased dietary variety, and "value" pricing encourages low-cost purchase and consumption of extra calories from sugared beverages and French fries that may increase meal size consumed. In a nationally representative sample, 37 percent of adults and 42 percent of children reported eating fast food on the prior day.[110] Higher intakes of energy, fat, saturated fat, sodium, and carbonated soft drink were seen in those who reported eating fast food compared to those who did not.[115] In a different sample from four U.S. cities, children and teens reported consuming almost twice the calories (770 vs. 420) and a significantly greater percentage of calories from fat (36.3 vs. 27.4) for meals and snacks eaten from restaurants, fast food venues, and similar establishments then they ate when they ate at home.[113]

In 2003, 40 percent of California adults ate at least one meal outside the home on the prior day and 40 percent of those meals were eaten at a fast food place. Young adults ate at least one meal outside the home significantly more than did older adults—47 percent of 25-34 year old males and 53 percent of 18-24 year old females compared to 22 percent and 27 percent, respectively of older adults 65 years and over. Eating fast food was related to greater likelihood of eating deep fat fried foods and fewer fruits and vegetables.[83] In 2003, 31 percent of California teens reported eating one or more fast

food meal or snack on the previous day, increasing to 37 percent of African-American teens,[22] while in 2001, 60 percent of teens who ate fast food reported eating deep fried food on the day before the survey compared to 21 percent for those who did not eat fast food.[23]

Barrier – Physical Inactivity and the Built Environment

At the same time, there has been a reduction in opportunities to burn calories during daily living. Children watch more television, the availability of physical education classes at school has diminished, sidewalks for safe walking are not part of many neighborhoods, and automation and labor-saving equipment are prevalent in both the workplace and household. Automobile travel has replaced walking and bicycling for most everyday transit, and suburban living has produced neighborhoods where shopping is centralized and isolated rather than integrated into residential streets.[115] In fact, reliance on automobiles in the United States is even evident for trips less than one mile, with an estimated 75 percent of these trips taken by car.[116] Time spent in automobiles may be linked to obesity. One study found there was a six percent increase in the likelihood of obesity for each additional hour in the car.[94] In addition, unsafe neighborhoods can be a serious barrier for the disadvantaged and ethnic minorities most in need of activity opportunities. At a more individual level, overweight persons may have difficulty finding suitable exercise equipment and instruction or experience bias when engaging in organized or structured physical activity that discourages them from further efforts.

Convincing children to limit television viewing and other sedentary pursuits shows some promise as a strategy for obesity prevention.[117] However, this is a challenge because it requires educational efforts aimed to both children and their parents. Engaging adolescents in additional physical education may require system-wide changes. The California school system requires only two years of high school physical education classes.[118] Teens who are juggling heavy class loads, jobs, and extra-curricular activities may be reluctant to take a class that is not required. Only 55 percent of CalTEENS boys and 53 percent of girls reported being enrolled in a physical education class by ages 16-17 compared to 93 and 92 percent respectively for 12-13 year old boys and girls.[23]

Barrier – Cost

Cost is another barrier to obesity prevention and achieving weight loss. Health services that help people learn effective methods of weight control, such as consultation with a dietitian, are often not covered by medical insurance or are covered for only a few visits, not enough time to implement and sustain long-term lifestyle change. Further, although it is possible to eat a healthy diet in a thrifty manner, lower prices per calorie for refined grain products, added sugars, and added fats compared to lean meat, fish, vegetables, and fruits contribute to a perception, particularly among those of low income, that it is too costly to eat healthy foods.[119]

Barrier – Conflicting Weight Control Information

Consumer confusion is yet another barrier. The public is inundated with a wide variety of diets purported to lead to weight loss. Often there is conflicting information and the consumer does not know how to make a sound judgment about choosing a weight loss diet (See Box 1). A 2005 paper by Dansinger and colleagues used a comparative experimental design to compare four prominent weight loss programs: Atkins, Ornish, Weight Watchers, and Zone. The Atkins diet severely restricts carbohydrate consumption; the Ornish diet is very low fat and vegetarian; Weight Watchers uses a calorie/fiber-based point system; and the Zone recommends a diet very high in protein, medium in fat, and relatively low in carbohydrates (30-30-40 percent of each, respectively, 0.75 protein to carbohydrate ratio required with each meal). At the end of one year, they found only a 4.6-7.3 lb. weight loss, with the Atkins dieters losing the least and the Ornish dieters losing the most. Adherence ranged from 50-53 percent for the more extreme Ornish and Atkins diets to 65 percent for Weight Watchers and the Zone diet.[120]

These fad-diets have not shown to be effective over time. Individuals who adhere to fad-diets may see immediate results but have difficulty maintaining weight loss over time. Sustaining weight loss requires a change in eating and exercise lifestyle. Thus, access to reliable resources about weight-loss and weight management is essential. Achieving a healthy weight requires gradual weight loss through the reduction of caloric intake, improved dietary intake and increased physical activity (See Box 1). Federal government material, such as Aim for a Healthy Weight and the Weight Information Network and those from other reputable organizations such as the American Academy of Pediatrics and the University of California Berkeley Center for Weight and Health provide tools for successful weight loss and maintaining a healthy weight (See Resources).

Box 1: Safe and Effective Weight-Loss Diets for the General Public*

A safe and effective weight loss diet should…

- Produce **gradual weight loss**—1 to 2 pounds a week.
- Contain foods from each of the **major five food groups.**
- **Limit fat**, especially saturated fat.
- **Limit added sugar.**
- Provide the individual with guidance regarding **moderate portion sizes.**
- Contain enough **variety in food choices to prevent boredom** when followed for an extended time period.
- Include foods and meal patterns that allow for **differences in ethnicity, culture, food preferences, and lifestyle.**
- Contain foods that are **affordable** to the individual.
- **Be consistent with overall good health practices** so that, with less calorie restriction, it can be followed for life so re-gaining weight can be avoided.
- Be **paired with an individualized, regular physical activity plan** that can be adopted for life.

Information compiled from: National Heart, Lung, and Blood Institute website: *Aim for a Healthy Weight*
http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/index.htm
Dietary Guidelines for Americans 2005- Chapter 3 Weight Management
National Institute of Diabetes and Digestive and Kidney Disorders Weight Control Information (WIN) website: *Choosing a Safe and Successful Weight Loss Program*
http://win.niddk.nih.gov/publications/choosing.htm

Individual Barriers

Several individual barriers to change need also be mentioned. The first is an individual's lack of perception of the need to change – either due to a lack of awareness that one's body weight status is too high or lack of knowledge of the risks of obesity as a contributor to many other diseases. Box 2 describes the conditions, both those that can be changed and those that cannot, that should serve to alert an individual and her health provider that her body weight status may be of greater concern than the average.

Lack of time is another barrier to eating healthier foods, such as fruit and vegetables, and to being more physically active frequently cited by both adults and teens.[22, 84, 99,121] It is worth noting that while one third of teens reported that they did not have enough time to be more physically active, one third also reported watching two hours or more of TV a day, with a mean of over 2 ½ hours of daily TV.[22]

Box 2 -- Rx Clinical Implications #1: Personal Adult Factors That Raise the Risk from Overweight and Obesity*

- History of coronary heart disease, heart attack, or coronary artery disease, surgery, and/or procedures
- Type 2 diabetes
- Sleep apnea
- Impaired fasting glucose
- Hypertension
- LDL-cholesterol ≥ 160 mg/dL OR 130 - 159 mg/dL if accompanied by two or more other risk factors
- HDL-cholesterol < 35 mg/dL
- Serum triglycerides ≥ 400 mg/dL
- Family history of early coronary heart disease
- Cigarette smoking
- Male ≥ 45 years
- Female ≥ 55 years or postmenopausal
- Physical inactivity

* Compiled from National Institutes of Health. 1998. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*. National Heart, Lung, and Blood Institute. Obesity Education Initiative. http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.htm

Myths

Myth Only adults need to worry about the health effects of being overweight.

Fact Children as young as 2-5 years old that were overweight or at-risk for overweight were more likely to have high or borderline high blood pressure than children of normal weight.[122] Rather than pushing a child into strict dieting, parents should be encouraged to play more actively with their young children, limit television, and prepare and serve healthy foods.

Myth The likelihood overweight children will become overweight or obese in adulthood is slim.

Fact Findings have demonstrated that overweight children's risk of becoming overweight in adulthood increase with age.[123] The chances of overweight children becoming overweight adults is 1.3 times greater at age 1-2 years to 17.5 times greater at 15-17 years old compared to children of normal weight at those ages.[124] However, even overweight toddlers are at increased risk of later overweight.[125]

Myth Children spend most of their free time engaging in physical activities such as exercising and playing sports.

Fact In the U.S., based on findings from a seven-day media use diary, children ages 8-18 years spend over 5.5 hours free time watching television and movies/videos, using computers, and playing video games combined compared to 1.25 hours engaging in physical activities including exercising and playing sports.[126]

Myth Parents should not be concerned about the amount of television children watch.

Fact Television viewing has a very strong relationship to overweight in children. Young people who watched more than five hours of television daily were nearly five times more likely to be overweight than those watching zero to two hours of television.[127] TV watching has also been associated with obesity in adults.[128]

Myth There are few disparities related to the underweight population in the United States.

Fact Although underweight only affects approximately 2 percent of adults, alarming disparities among those underweight exist. Women were nearly four times as likely as men to be underweight. Young adults (18-24 years) and the oldest adults (75 years and over) were nearly twice as likely to be underweight than other adult age group. Disparities exist among race/ethnicity and gender with nearly 9 percent of Asian women found to be underweight.[8]

Common Concerns/Strategies

The cause of rising obesity levels is multi-factorial and complex. A diversity of strategies will be required to prevent further increases in obesity rates and turn them around. They include individual, institutional, community, and environmental systems as well as policy-level changes. The Institute of Medicine's extensive report on prevention of childhood obesity identified immediate steps that should be taken in seven sectors of society.[129] Only one addressed change at the individual/family level. Other sectors included the federal government; state and local governments; industry and media; health-care professionals; community and non-profit organizations; and state and local education authorities; and schools.

People are more vulnerable to increased risk of obesity simply because they are at certain points in the lifecycle (See Box 3). Pregnancy, infancy, early childhood, puberty, and menopause are periods when intervention efforts may affect long-term change.[103]

From a prevention perspective, implementing strategies that result in increased physical activity and improvement in dietary behaviors that have the most consistent evidence as helping to prevent obesity is crucial. Key dietary behaviors include eating less dietary fat, more total carbohydrate, more dietary fiber, more fruits and vegetables, fewer sweetened beverages, more calcium, more dairy, and less restaurant-prepared/fast food, skipping fewer breakfasts, and doing more breastfeeding. In addition, facilitating changing from a dietary pattern high in red meat, high fat dairy, other saturated fats, and large amounts of sugar to a pattern high in legumes, whole grains, low fat dairy, fruit, and vegetables can be implemented as a more general strategy that incorporates many of the key dietary behaviors.[85, 103]

Box 3 – Rx Clinical Implications #2: Key Stages of Life and Raised Obesity Risk[101]

- Before birth - An environment in the uterus that produces a low birth weight baby∞
- Infancy and early childhood – Rapid weight gain in the first four months; more gain in weight for age than height for age in the first two years; earlier time in childhood between 4-8 years when BMI starts to climb again after reaching its lowest point (adiposity rebound)
- Puberty – Early puberty and higher BMI are associated, but the relationship may be in both directions; can be influenced by lower levels of physical activity at this life stage
- Pregnancy – Women at higher risk to retain more pregnancy weight: gain more than others during pregnancy, are African-American, are teens who are still growing, and/or are lower-income
- Menopause – Associated with increased body fat, especially in the abdominal area; intensified due to reduced physical activity that often occurs at this life stage
- Old age - Not a high risk time period for *becoming* overweight; levels off during a person's sixties and starts to decline after 70 years of age; *healthy weight range may be higher than for younger people*

∞ Both low and high birth weight (HBW) have been associated with higher attained BMI in childhood and adulthood, but recent studies suggest that the relationship between HBW and lean body mass in later life may be positive, while the relationship with adiposity is less clear.

Recently, increased attention has been paid to intervention beyond that at the personal level. At a community and societal level, multiple steps must be taken to bring about changes in the environment and in social norms. Public awareness must be increased about contributing factors to poor eating and exercise habits. In addition, the serious--rather than merely cosmetic—health and economic implications of obesity need to be addressed. A paradigm shift to an upbeat, positive message is needed that turns the

educational emphasis from ideal weights and rigorous exercise to messages of reasonable goals, strategies to overcome barriers, peer support, and habits employed by people who are successful at maintaining a healthy weight. Improved nutrition and fitness should be the focus even for those who remain overweight. Messaging that stigmatizes those who are overweight is counterproductive and may contribute to the development of eating disorders. For both youth and adults, messages must be culturally appropriate, relevant, and, for youth in particular, emphasize near-term benefits of eating healthy food and becoming physically active. In addition, the same marketing techniques that have been used to promote unhealthy foods and sedentary pursuits can be used to advocate healthy lifestyle practices.

Innovations in food assistance programs can be initiated to encourage children and adults to choose healthier foods. Examples would include limiting the sale of foods that compete with the federal School Meal Program to those that are consistent with the U.S. Dietary Guidelines and dissemination of incentives in the WIC and Food Stamp programs for purchase of fruits, vegetables, whole grain, and low fat dairy items.

New programs for obesity prevention must be developed and existing programs should be expanded to reach a larger target population. For youth, sustainable school-based initiatives can foster a positive atmosphere for promoting healthy eating and physical activity and for preventing/rectifying overweight. For example, initiating policy that mandates daily physical education that emphasizes life-long activity increases the likelihood that youth will reach the daily goal for an hour of physical activity, while policy change that promotes high quality foods in vending machines and cafeterias improves the probability of healthier eating.[129] The evidence-based review cited above for family interventions noted the positive evidence for similar components in successful primary and secondary prevention programs in schools, as well as physical activity environmental changes and possibly changes in the food environment and media influences. High school-based programs were more likely to be successful than those in elementary schools.[130] For adults, multi-channel strategies are needed that deliver practical, attainable messages and provide opportunities for "health moments" in the workplace, supermarket, restaurants, and media.[131] Physical activity options need to be developed that provide the already overweight with user-friendly, affordable facilities, equipment and instruction to achieve fitness.[132]

Changes in the community infrastructure that encourage physical activity have the potential to alter social norms, e.g. the development of school athletic facilities that are available for public use when not being used by students. Policies that improve neighborhood and park safety and increase access to sidewalks, bicycle paths, and shopping and recreation within walking and biking distance can improve the physical environment, which is associated with lower rates of obesity.[133] Building safe communities and fostering social support networks, such as worksite walking clubs, extensive parks, and recreational activity programs, are additional approaches to making physical activity the social norm.

At the individual level, for weight reduction, effective weight control programs for adults should incorporate dietary therapy, physical activity, and behavior therapy. The

combination of a lower calorie diet and increased physical activity leads to weight loss, decrease in abdominal fat, and increased cardio respiratory fitness. Behavior therapy is helpful for both weight loss and maintenance of weight. Pharmacotherapy and weight-loss surgery are options clinicians may consider when working with severely obese individuals. At a minimum, practitioners should encourage overweight individuals with two or more additional risk factors to set a six-month target weight loss goal of 10 percent of body weight, which substantially reduces the severity of obesity-related risk factors.[10]

Box 4 - Characteristics of People Who Have Successfully Lost 30 or More Pounds and Kept It Off for One Year or More*

- Make major changes in their eating and physical activity habits to lose weight and keep it off. They keep these changes up after losing the weight.
- Do 60 to 90 minutes of daily physical activity.
- Eat breakfast every day.
- Eat healthy low-calorie, low-fat foods that include fruits, vegetables, and other high-fiber foods.
- Keep track of their calorie intake on an ongoing basis.
- Weigh themselves almost every day.

* The National Weight Control Registry: Research Findings
http://www.nwcr.ws/Research/default.htm

However, weight loss is usually not recommended for most children unless there are serious co-morbidities such as metabolic syndrome. Preferentially, the goal is to prevent further weight gain, allowing the child's height to catch up with their weight. Calorie restrictive dieting may slow growth and intellectual development. Food-based goals should encourage consumption of fruit, vegetables, and dairy and decreased consumption of sugary drinks, fat, and fast foods. For children, approaches that increase physical activity and reduce sedentary activity may be effective strategies to prevent obesity or help bring weight in line with continued growth.[134, 135] An intervention that encouraged children to budget television/video game time and choose more selectively, enlisted parent cooperation, and provided television monitors produced a significant relative decrease in body mass index and other measures related to body fat for intervention participants compared to controls.[117]

An extensive evidence-based analysis found that, for children and teens that are *already* overweight there is insufficient research to support routine recommendation for individual intervention. However, for family-based interventions, with school-age children, multi-component programs were recommended and evidence was strongest for including parent training, dietary counseling, and physical activity paired with a reduction in sedentary behavior, and family behavioral counseling as components of the intervention. Since only limited research with pre-school-age children and adolescents was available, evidence-based conclusions were not drawn for these populations.[130]

Opportunities for Improvement

- **Federal government** should be encouraged to take a leadership role; provide coordinated leadership for obesity prevention in children and youth.
- **Local governments** should be encouraged to change zoning ordinances and provide developers with incentives for designing communities that incorporate mixed-used land usage, a grid design, walking trails, safe routes to school, and other neighborhood features that increase physical activity patterns. New buildings could be developed in a manner to encourage physical activity such as stair climbing.
- **Medical community and food programs** should be encouraged to provide healthcare providers, especially pediatricians, and food programs with training and resources to address childhood obesity, inappropriate feeding practices, and the advantages to the baby of breastfeeding
- **Schools** in California should be encouraged to consider instituting a daily, more intensive, interesting physical education requirement for all students, grades K-12. They should also be encouraged to limit the sale of competitive foods on campus to items consistent with Dietary Guidelines. Concurrently, the school system could consider subsidizing the cost of fruits, vegetables, whole grain foods, and low fat/nonfat dairy products and soy foods/beverages. Schools should be encouraged to not permit marketing of unhealthy food products on their premises.
- **Local businesses and agricultural community representatives** should be encouraged to provide support and technical assistance for the establishment of farmers' markets and the addition of fresh produce to convenience stores to increase access to and make available affordable healthy foods for all segments of the population.
- **California Department of Social Services, CDHS, or a Food Stamp affiliate** should be encouraged to consider initiating a pilot program to provide and track usage of bonus Food Stamps for purchase of high nutrient low calorie foods, such as fruits and vegetables.
- **Government and civic organizations** should be encouraged to give public recognition to restaurants and fast food establishments that voluntarily display nutrition information, such as calories, and develop and promote lower calorie, high nutrient menu choices and appropriate portion sizes.
- **Worksites** should be encouraged to provide employees with on and off-site benefits that 1) facilitate physical activity; 2) support healthy food service and vending options; and 3) encourage their health insurance carriers to include healthy lifestyle benefits for their employees. They could receive public recognition, and incentives for their effort.

Achieving Success: California Obesity Prevention Plan

To help reverse the trend in unhealthy body weight endemic in California, change is required in many sectors of daily life. Governor Schwarzenegger's Summit on Health, Nutrition, and Obesity in September 2005 brought together public and private leaders from industry, philanthropic organizations, health care, and other key segments with the ability to address this crisis, encouraging them to initiate the types of changes in that would foster an environment conducive to healthy eating and active living. In preparation for the Summit, the State developed a 10-step Vision for California that presents us with a California future in which this goal can be achieved. In September, 2006 the Governor's office released the *California Obesity Prevention Plan: A Vision for Tomorrow, Strategic Actions for Today* to further help realize this goal by strategically employing all sectors of California – employers, schools, health care, industry, family, entertainment and government – to take action together. (See http://www.dhs.ca.gov/CAObesityPrevention/California%20Obesity%20Prevention%20Plan.pdf)[131]

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Governor's Vision for a Healthy California
A Vision for California – 10 Steps toward Healthy Living[131]

1. Californians will understand the importance of physical activity and healthy eating, and they will make healthier choices based on their understanding.
2. Everyday, every child will participate in physical activities.
3. California's adults will be physically active every day.
4. Schools will only offer healthy foods and beverages to students.
5. Only healthy foods and beverages will be marketed to children ages 12 and under.
6. Produce and other fresh, healthy food items will be affordable and available in all neighborhoods.
7. Neighborhoods, communities, and buildings will support physical activity, including safe walking, stair climbing, and bicycling.
8. Healthy foods and beverages will be accessible, affordable, and promoted in grocery stores, restaurants, and entertainment venues.
9. Health insurers and health care providers will promote physical activity and healthy eating.
10. Employees will have access to physical activity and healthy food options.

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Resources/Web Sites:

American Obesity Association.
1250 24th St., NW, Suite 300
Washington, DC 20037
Phone: (202) 776-7711
Fax: (202) 776-7712
Website: http://www.obesity.org

- *A Taxpayer's Guide on IRS Policy to Deduct Weight Control Treatment; Preventing the Elimination of Disability Coverage for the Obese*

American Society of Bariatric Physicians.
5453 East Evans Place
Denver, CO 80222-5234
Phone: (303) 770-2526
Fax: (303) 779-4834
E-mail: info@asbp.org
Website: http://www.asbp.org/

California Adolescent Nutrition and Fitness Program (CANFit)
2140 Shattuck Avenue, Suite 610
Berkeley, CA 94704
Phone: (510) 644-1533
Fax: (510) 644-1535
E-mail: info@canfit.org
Website: http://www.canfit.org

- Preventing Obesity in the Hip-Hop Generation Workshop
- *Promoting Health and Preventing Obesity in After School Programs; Obesity and Diabetes Prevention in Communities of Color*

California Center for Public Health Advocacy
P.O. Box 2309
Davis, CA 95619
Phone: (530) 297-6000
Fax: (530) 297-6200
http://www.publichealthadvocacy.org

- *The Growing Epidemic: Child Overweight Rates on The Rise In California Assembly Districts*
  http://www.publichealthadvocacy.org/policy_briefs/overweight2004.html

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California Department of Health Services
Director's Office
MS 0000, P.O. Box 997413
Sacramento, CA 95899-7413
Tel: (916) 440-7400
Fax: (916) 440-7404
Website: www.dhs.ca.gov

- *California Obesity Prevention Plan: A Vision for Tomorrow, Strategic Actions for Today*. http://www.dhs.ca.gov/CAObesityPrevention/

California Department of Health Services
Office of Women's Health
MS 0027, P.O. Box 997413
Sacramento, CA 95899-7413
Tel: (916) 440-7626
Fax: (916) 440-7636
Website: http://www.dhs.ca.gov/director/owh/
Email: OWHmail@dhs.ca.gov

- Body Weight and Obesity-Related Risk Factors and Relationships among California Women: 1997 – 2002 in *Women's Health: Findings from the California Women's Health Survey, 1997-2003*, an examination of trend data on women's health issues; Office of Women's Health http://www.dhs.ca.gov/director/owh/owh_main/cwhs/wmns_hlth_survey/97-03_findings/CWHS_Findings_97-03.pdf
- Data Points 2003-2004; Results from the California Women's Health Survey; Office of Women's Health (Selected Data Points) http://www.dhs.ca.gov/director/owh/owh_main/cwhs/wmns_hlth_survey/03-04_data_points/060703%20Data%20Points%20Press.pdf
    - Healthy Weight among California Women, 2004
    - Prevalence of Obesity and Disparities in Obesity-Related Factors among California Women, 2004

The California Endowment
1000 North Alameda Street
Los Angeles, CA 90012
Tel: (800) 449-4149
Fax: (213) 928-8801
E-mail: questions@calendow.org
Website: http://www.calendow.org/

- Healthy Eating, Active Communities Program http://www.calendow.org/program_areas/heac.stm

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The California Endowment Sample Publications:

- Preventing Obesity in California: A Call for Policy and Community-Based Approaches http://www.calendow.org/reference/publications/pdf/disparities/Health%20in%20Brief%20V4I1.pdf
- National Evaluation Meeting on School Nutrition, Physical Activity Policies http://www.calendow.org/reference/publications/pdf/disparities/TCE1217-2004_National_Evalu.pdf
- A Survey of Californians About the Problem of Childhood Obesity
- http://www.calendow.org/reference/publications/pdf/disparities/TCE1126-2003_A_Survey_of_Ca.pdf

California Obesity Prevention Initiative
California Department of Health Services
MS 7211; P.O. Box 997413
Sacramento, CA 95899-77413
Phone: (916) 552-9889
Fax: (916) 552-9912
obesityprevention@dhs.ca.gov

- *Do More, Watch Less! TV reduction tool* http://www.dhs.ca.gov/ps/cdic/copi/documents/COPI_TV_Tool.pdf

Cancer Prevention and Nutrition Section (CPNS)
MS 7204; P.O. Box 997413
California Department of Health Services
Sacramento, CA 95899-7413
Phone: (916) 449-5406
Fax: (916) 449-5415
Website: http://www.dhs.ca.gov/ps/cdic/CPNS
Email: research@dhs.ca.gov

- *The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Heath Care, Workers' Compensation, and Lost Productivity. Topline Report* (with the & Epidemiology and Health Promotion Section) http://www.dhs.ca.gov/ps/cdic/CPNS//press/downloads/CostofObesityToplineReport.pdf
- *CPNS Statewide Survey Data Tables and Reports* http://www.dhs.ca.gov/ps/cdic/CPNS//research/rea_surveys.htm
- *California Data Sources Related to Obesity and Obesity Prevention* http://www.dhs.ca.gov/ps/cdic/CPNS//research/ca_datasources.htm

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Center for Healthy Weight

Lucile Packard Children's Hospital
725 Welch Road
Palo Alto, California 94304
See website and appropriate service for phone contact information:
http://www.lpch.org/clinicalSpecialtiesServices/ClinicalSpecialties/centerHealthyWeight/index.html

- A comprehensive program designed to prevent and treat overweight and obesity in children and adolescents – patient care, research, and development of community programs

Center for Weight and Health

College of Natural Resources
University of California
101 Giannini Hall #3100
Berkeley, CA 94720-3100
Phone: (510) 642-2915
Fax: (510) 642-4612
http://nature.berkeley.edu/cwh/
Contact: Gail Woodward-Lopez at gwlopez@nature.berkeley.edu

- An extensive source of research reports, resources, tools, educational materials, links, and a directory of professionals on website

Sample Center for Weight and Health Tools:

- *Children and Weight tool kits for health professionals and communities*
- *Let's Get Moving!: Working Together to Promote Active Lifestyles in Young Children* (For persons working with children ages 2-7)
- *"Fit Families Novela Series" and "Let's Get Moving!" video kits*
- Asian language pamphlets on nutrition for parents and families - Download both low and high resolution pamphlets in Korean, Vietnamese, Chinese, Hmong, and English. Topics in all languages include healthy food, healthy weight, fast food, active play, and limiting screen time.

Sample Center for Weight and Health Publications:

- *Obesity--Dietary and Developmental Influences*
- *Weighing the Risks and Benefits of BMI Reporting in the School Setting*

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Centers for Disease Control and Prevention, National Center for Health Statistics
6525 Belcrest Road
Hyattsville, MD 20782-2003
Phone: (301) 458-4636
http://www.cdc.gov/nchs/

- Overweight and Obesity Home Page
http://www.cdc.gov/nccdphp/dnpa/obesity/
- Obesity Trends: U.S. Obesity Trends 1985–2004
http://www.cdc.gov/nccdphp/dnpa/obesity/trend/maps/index.htm
- *Research to Practice Series #1 - Can Eating Fruits and Vegetables Help People Manage Their Weight?*
http://www.cdc.gov/nccdphp/dnpa/nutrition/pdf/rtp_practitioner_10_07.pdf
- Body Mass Index Home Page
http://www.cdc.gov/nccdphp/dnpa/bmi/index.htm
  -- Calculating body mass index for children
  http://www.cdc.gov/nccdphp/dnpa/bmi/bmi-for-age.htm
  -- Children's growth charts http://www.cdc.gov/growthcharts/
- Childhood Overweight Home Page
http://www.cdc.gov/healthyyouth/obesity/index.htm

Federal Trade Commission Website: http://www.ftc.gov/

Western Region
Federal Trade Commission
901 Market Street, Suite 570
San Francisco, CA 94103

Western Region
Federal Trade Commission
10877 Wilshire Blvd., Suite 700
Los Angeles, California 90024

- *Weight Loss Advertising: Analysis of Current Trends*
http://www.ftc.gov/bcp/reports/weightloss.pdf

For Consumer Complaints contact the Consumer Response Center:
Consumer Response Center, Federal Trade Commission
600 Pennsylvania Ave, NW
Washington, D.C. 20580
Phone: toll free 877-FTC-HELP (382-4357); 9:00 am to 5:00 pm Eastern Standard Time, Monday through Friday
Electronically: https://www.ftc.gov/ftc/complaint.htm

Food and Nutrition Information Center
National Agricultural Library/USDA
10301 Baltimore Avenue, Room 304
Beltsville, MD 20705-2351

- *Eating Disorders: a Food and Nutrition Resource List for Consumers*
http://www.nal.usda.gov/fnic/pubs/bibs/gen/eatingdis.htm
- *Reports and Studies on Obesity* http://www.nal.usda.gov/fnic/reports/obesity.html

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Healthy Weight Network
402 South 14th Street
Hettinger, ND *58639.*
Phone: (701) 567-2646
FAX: (701) 567-2602
Website: www.healthyweight.net

- *Healthy Weight Journal http://www.healthyweight.net/hwj.htm*
- *Women Afraid to Eat: Breaking Free in Today's Weight-Obsessed World*
- *Children and Teens Afraid to Eat: Helping Youth in Today's Weight-Obsessed World*

Kaiser Permanente Community Health Initiatives
Community Health Initiatives – programs run by regional KP organizations
Healthy Eating Active Living (HEAL)
Northern California Regional Administrative Office
1950 Franklin
Oakland, CA 94612
Website: http://xnet.kp.org/communitybenefit/chi/index.html

- *KP Farmers' Market Resource Guide*
- *KP TV Turnoff Report*

National Association to Advance Fat Acceptance
P.O. Box 188620
Sacramento, CA 95818
Phone: (916) 558-6880
Fax: (916) 558-6881
Website: http://naafa.org

National Eating Disorders Association
603 Stewart St., Suite 803,
Seattle, WA 98101
Business Office: (206) 382-3587
Toll-free Information and Referral Helpline: (800) 931-2237
info@NationalEatingDisorders.org
http://www.nationaleatingdisorders.org/p.asp?WebPage_ID=337

National Heart, Lung, and Blood Institute
P.O. Box 30105
Bethesda, MD 20824-0105
Phone: (301) 592-8573
Fax: (301) 592-8563
E-mail: NHLBIinfo@rover.nhlbi.nih.gov
Website: http://www.nhlbi.nih.gov/

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NHLBI Publications

- *WeCan!* Ways to Enhance Children's Activity and Nutrition – parent and family tips
- *The Practical Guide: Identification, Evaluation, And Treatment Of Overweight And Obesity In Adults.* (with NAASO below) http://www.nhlbi.nih.gov/guidelines/obesity/prctgd_c.pdf
- *Aim for a Healthy Weight – Information for Patients and the Public; Information for Professionals* http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/index.htm

North American Association of the Study of Obesity
NAASO Executive Office
8630 Fenton St. Suite 412
Silver Spring, MD 20910
Phone: (301) 563-6526
Fax: (301) 587-2365
Website: http://www.naaso.org

- Obesity Online – Educational resource offering free downloadable slides, free CME, critical presentations, searchable references, etc.
- *Obesity* (journal)

Shape Up America!
15009 Native Dancer Road
N. Potomac, MD 20878
Phone: (240) 631-6533
Fax: (240) 632-1075
E-mail: info@shapeup.org
Website: http://www.shapeup.org/

- 10,000 Step Pedometer Program
- *Fitness and Weight Management Directory*
- *Parent Guide for the Assessment & Treatment of the Overweight Child*

Shaping America's Youth (SAY)
Academic Network, LLC
120 NW 9th Avenue, Suite 216
Portland, OR 97209-3326
Phone: 800-SAY-9221
Fax: (503) 273-8778
E-mail: www.academicnetwork.com
Website: info@shapingamericasyouth.com

- *Publications and Resource list* http://www.shapingamericasyouth.com/Page.aspx?hid=29
- *Shaping America's Youth Summary Report*

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Strategic Alliance
265 29th St.
Oakland, CA 94611
Phone: (510) 444-7738
Fax: (510) 663-1280
Email: SA@preventioninsitute.org
Website: www.eatbettermovemore.org/

- Resource list http://www.preventioninstitute.org/sa/resources.html
- *ENACT: Environmental Nutrition and Activity Community Tool*
- *Unhealthy Marketing to Kids*

TV Turnoff Network
1200 29th Street, NW
Lower Level #1
Washington, D.C. 20007
Phone: (202) 333-9220
Fax: (202) 333-9221
E-mail: email@tvturnoff.org
Website: www.tvturnoff.org

- *The Overwatched American*

Trust for America's Health
1707 H Street, NW 7th Floor
Washington, D.C. 20006
Phone: (202) 223-9870
Fax: (202) 223-9871
E-mail: info@tfah.org
Website: http://healthyamericans.org/

- *F as in Fat 2006: How Obesity Policies are Failing in America* http://healthyamericans.org/reports/obesity2006/

U.S. Department of Health and Human Services

- *The Surgeon General's Call to Action Prevent and Decrease Overweight and Obesity;* To download: http://www.surgeongeneral.gov/topics/obesity/
  To order: The stock number is 017-001-00551-7; the cost is $5.50 per copy.
  Superintendent of Documents
  U.S. Government Printing Office, Mail Stop SSOP
  Washington, D.C. 20401-0001
  Phone: toll free 1-866-512-1800
  Fax: (202) 512-2250
  Order online at http://bookstore.gpo.gov/.

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U.S. Department of Health and Human Services
BodyWorks Tool Kit
Website: http://www.womenshealth.gov/BodyWorks/index.cfm
Contact: For more information about the BodyWorks Program, becoming a trainer, or how to find a trainer in your community,Dr. Jonelle Rowe, M.D., M.A.
Office on Women's Health
bodyworks@hagersharp.com

- BodyWorks is a program designed to help parents and caregivers of young adolescent girls (ages 9-13) improve family eating and activity habits. Using the BodyWorks Toolkit, the program focuses on parents as role models and provides them with hands-on tools to make small, specific behavior changes to prevent obesity and help maintain a healthy weight. The Office on Women's Health, U.S. Department of Health and Human Services, developed BodyWorks following two years of formative research.
- The BodyWorks program uses a train-the-trainer model to distribute the Toolkit through community-based organizations, state health agencies, non-profit organizations, health clinics, hospitals, and health care systems. The program includes one six-hour training module for trainers and ten 90-minute weekly sessions for parents and caregivers.

The Weight-Control Information Network, National Institute of Diabetes and Digestive and Kidney Diseases (WIN)
1 WIN Way
Bethesda, MD 20892-3665
Phone: (202) 828-1025 or 1-877-946-4627
Fax: (202) 828-1028
E-mail: win@info.niddk.nih.gov
http://win.niddk.nih.gov/index.htm
http://win.niddk.nih.gov/publilcations/health_risks.htm

- *Do You Know the Health Risks of Being Overweight?*
- *Sisters Together: Move More, Eat Better – a program and materials for African-American Women*
  http://win.niddk.nih.gov/publications/SisPrmGuide2.pdf
- *Active at Any Size*
- *Choosing a Safe and Successful Weight Loss Program*
  http://win.niddk.nih.gov/publications/choosing.htm

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World Health Organization (WHO)
Avenue Appia 20
1211 Geneva 27
Switzerland
Tel: (+ 41 22) 791 21 11
Fax: (+ 41 22) 791 3111
Telex: 415 416
Telegraph: UNISANTE GENEVA
Website: http://www.who.int/en/

- The WHO Child Growth Standards:

  General Information: http://www.who.int/childgrowth/en/
  Specific Standards: http://www.who.int/childgrowth/standards/en/
  WHO Child Growth Standards: Methods and development:
  http://www.who.int/childgrowth/publications/technical_report_pub/en/index.html

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