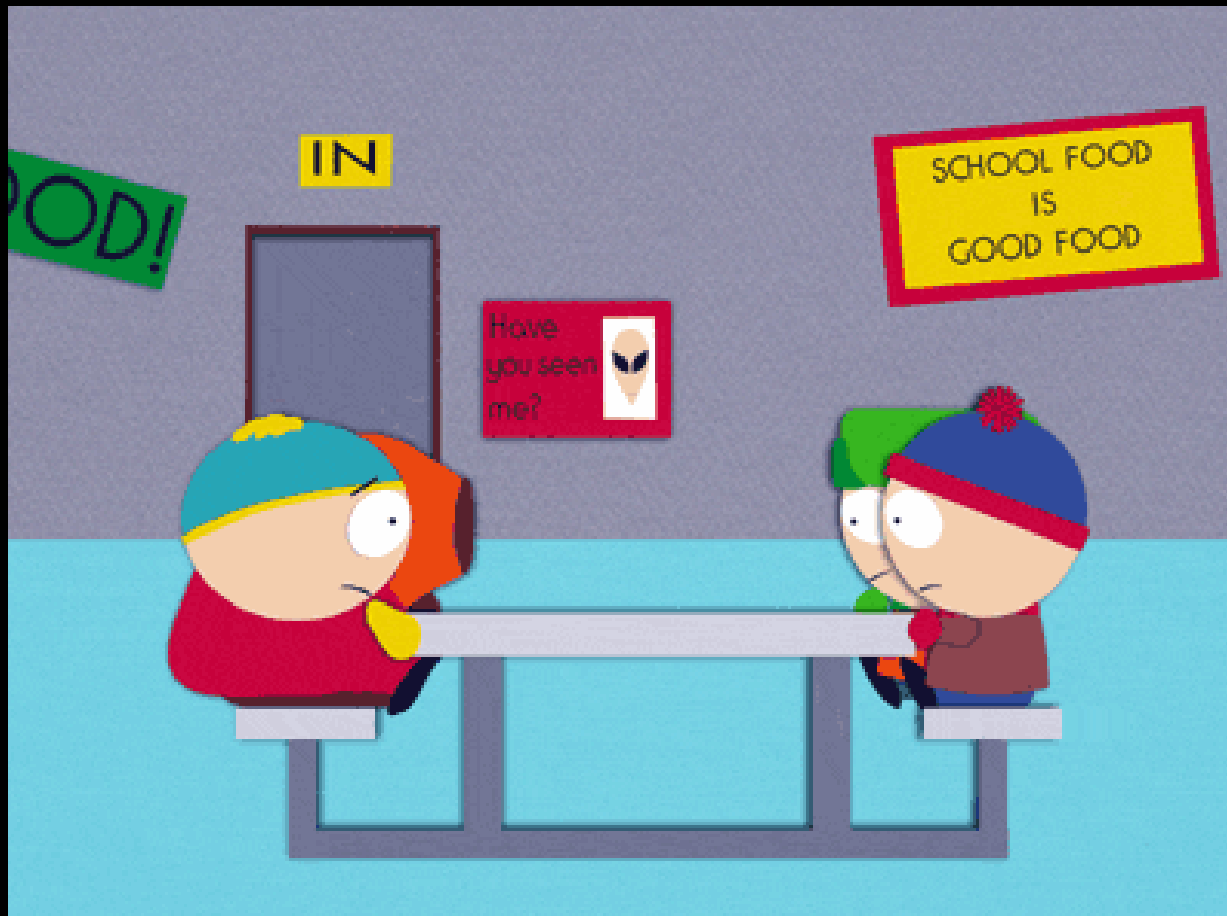


Obesity

A Review for Teachers



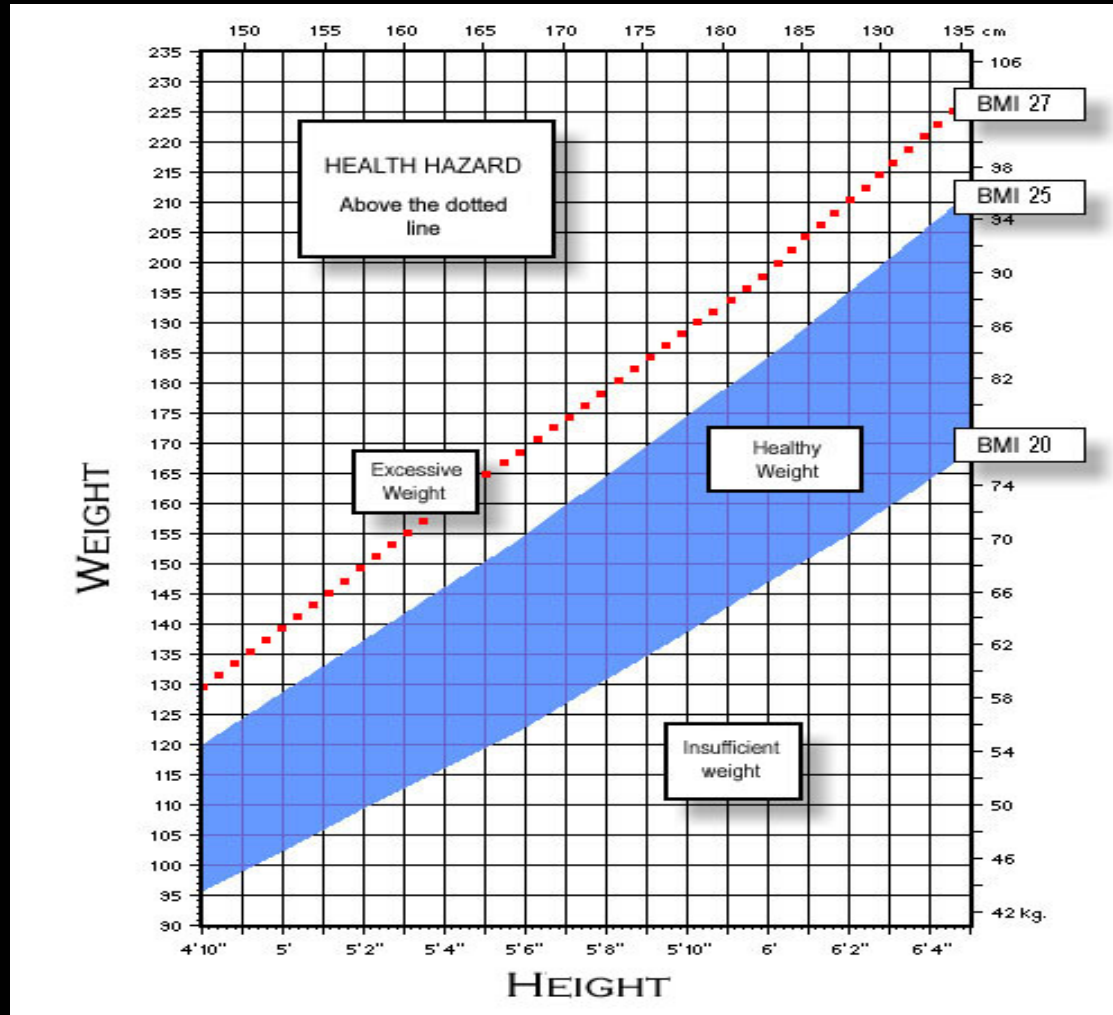
Outline

- The prevalence of obesity & associated medical problems has increased greatly in the US, both among adults & children.
- The causes are complex.
- Controlling obesity by exercise & diet is difficult.
- Drug therapy is not very effective. Surgery may be necessary for severe obesity.

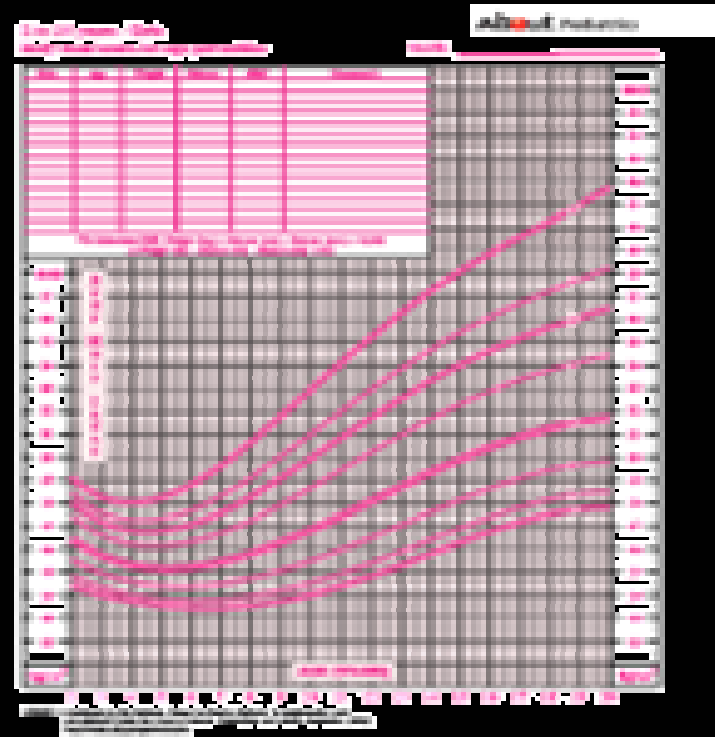
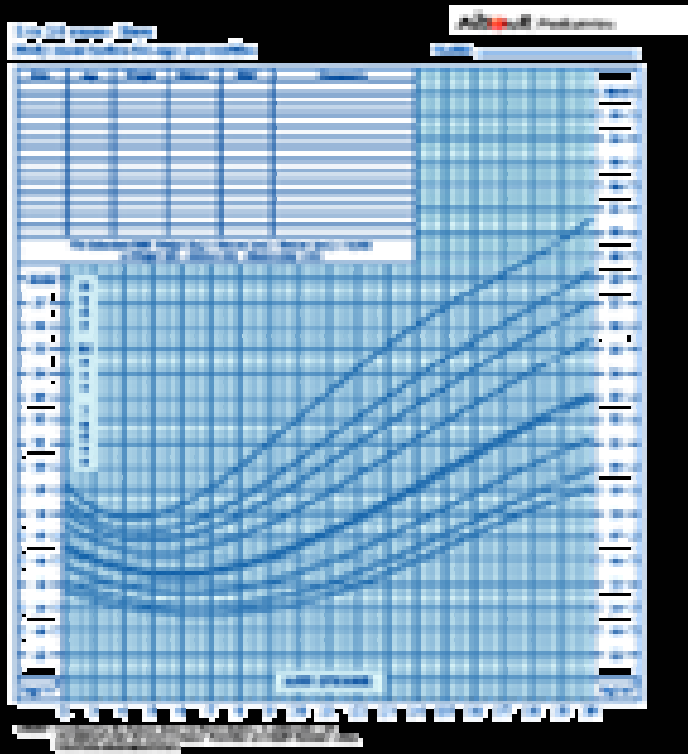
How Do We Define Overweight & Obesity?

- In adults, obesity is defined by the BMI (Body Mass Index), which is the weight in kilograms divided by height in meters squared. BMI >25 is overweight, >30 obese, >40 severely (morbidly) obese.
- The normal range for BMI must be adjusted for age & sex in children.

BMI Chart For Adults



BMI Charts For Children



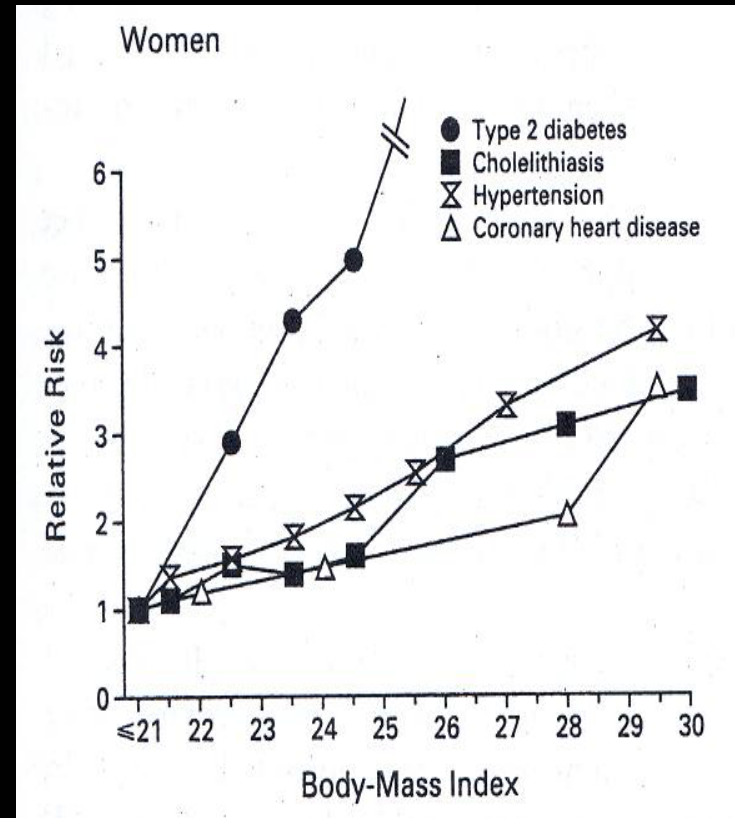
Some Types of Fat Are Worse Than Others

- Fat can be distributed all over the body or primarily in the abdomen- visceral fat
- Visceral fat is associated with the metabolic syndrome: high blood lipids, high blood pressure, & insulin resistance.



Being Overweight Is Bad For Us

- Overweight persons suffer discrimination.
- DM, hyperlipidemia, OHD, OSA, OA, cancer, & other problems increase with BMI.
- Overweight persons have reduced life expectancy.

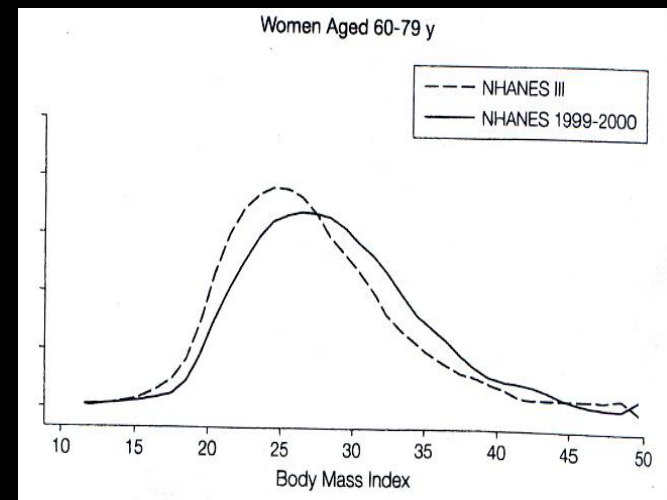
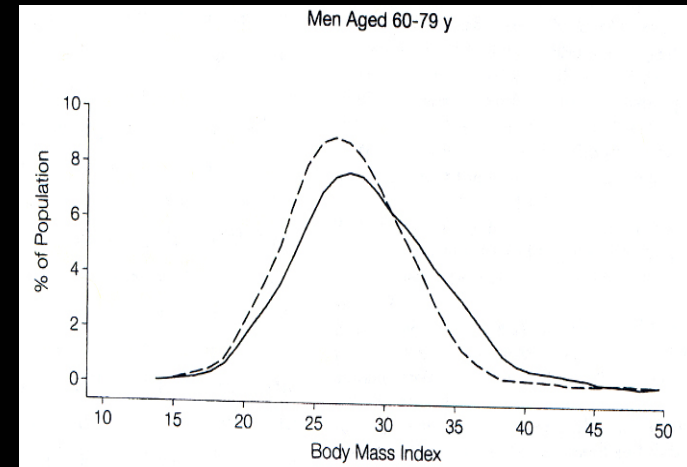


Health Problems Associated with Obesity

- The metabolic syndrome & diabetes are associated with obesity. The metabolic syndrome causes arteriosclerosis & heart disease.
- The risk of many forms of cancer is increased, as is the risk of
- Obstructive sleep apnea, osteoarthritis, non-alcoholic fatty liver (NAFL) , as well as
- Social discrimination & disability.

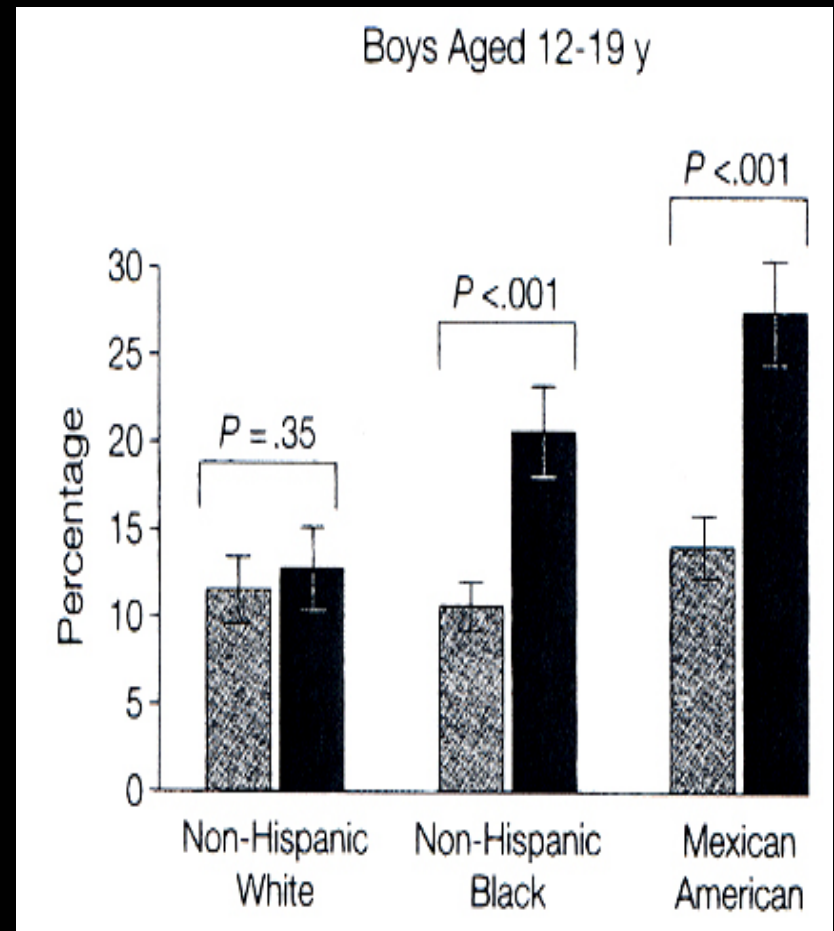
The Spread of Obesity

- In the last 30 years Americans have become the most overweight people on earth.
- 65% are overweight, 31% are obese, & 5% are morbidly obese.
- 16% of American children are obese.



Obesity in Children

- Obesity in children has increased markedly in the past 2 decades, most among AA & Hispanics
- Obese adolescents are developing adult-type diabetes!



GLOBESITY

- Obesity is becoming a global problem.
- The prevalence of obesity is increasing in Europe, Japan, & China.
- 10% of Chinese children are obese.



BEIJING BABY FAT: Some 30 million Chinese children are overweight, a number that could double in a decade

HEALTH

Obesity Goes GLOBAL

Children around the world are eating more like Americans—and getting dangerously fat as a result

By J. MADELEINE NASH HELSINKI

EIGHT-YEAR-OLD HANNAH MCGOEY lives in an upstairs apartment on a busy thoroughfare in London. She has no yard to play in, and her school holds physical-education classes just two days a week. Her busy parents tried to be careful about nutrition, giving up their Friday fish and chips, for example. But over the years, Hannah only became plumper. By the time she turned 6, children's sizes no longer fit her. "I would have to buy jeans for 12- and 14-year-olds," her mother Julia remembers, "and then cut a foot and a half off the leg."

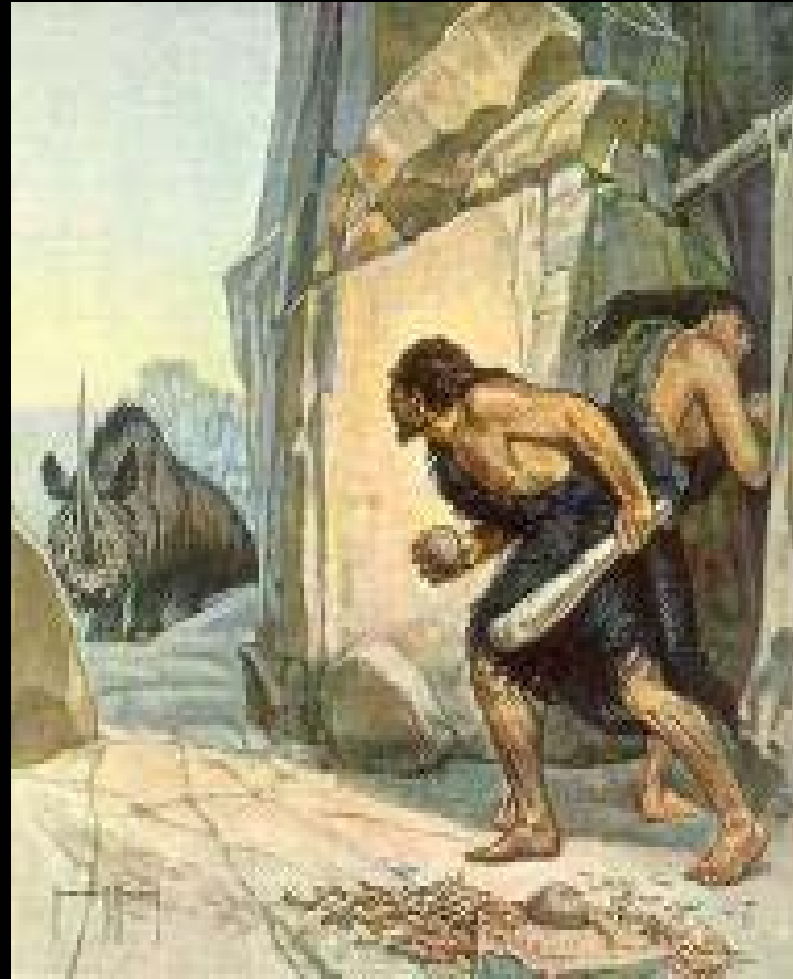
But things began to change when a school nurse told the McGoeyes about a program called MEND (mind, exercise, nutrition, diet), started by Paul Sacher, a dietitian at London's Great Ormond Street Hospital for Children. Hannah enrolled

Why Have We Gained So Much Weight?

- The current epidemic of obesity is not an epidemic of lack of character.
- Obesity is a “complex multifactorial chronic disease that develops from an interaction of genotype & environment...it involves the integration of social, behavioral, cultural, physiologic, metabolic & genetic factors”

Teleology

- Early humans evolved powerful mechanisms for storing & saving energy.
- They ate as much as possible when they had the chance, stored it as fat. They were energy efficient.



We Are Victims Of Our Success

- We still possess the adaptive traits of our Paleolithic ancestors. We are programmed to eat as much as we can & store it as fat. We are still energy efficient. If we had not developed these traits we would have become extinct,
- but we have changed our environment!

Starvation Is No Longer A Threat

- We can produce large quantities of cheap, convenient, tasty, high calorie food
- We are extremely good at marketing this food to adults and to children.



Our Diet Has Changed

- There are more two wage earner families & less time to cook food at home.
- We eat more fast food.
- Fast food has been heavily marketed to children.



Fast Food Marketing Is Very Effective

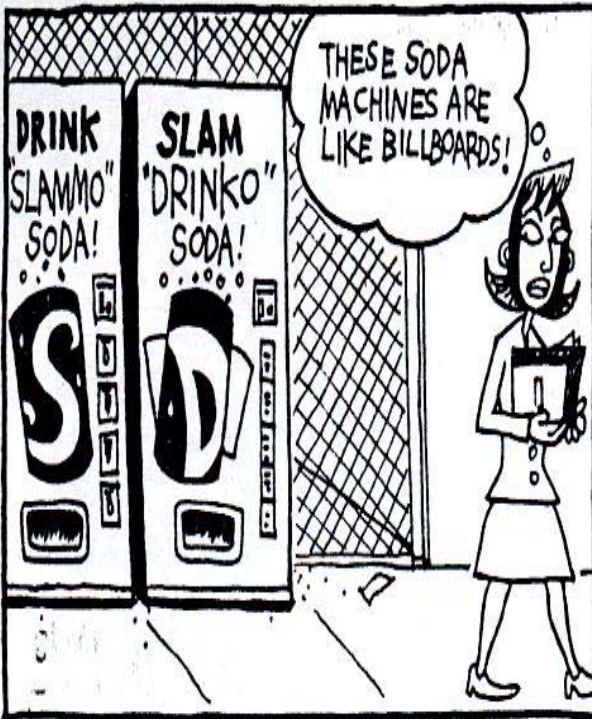


School Food Has Changed

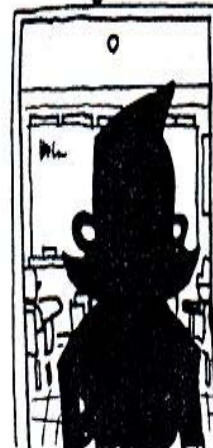
- School budgets have been reduced.
- Some schools have reduced their cafeteria services or contracted with fast food companies to provide food.
- Some schools have made up part of their budget deficits by allowing vending machines & fast food marketing in schools.

Fast Foods in Schools

LA CUCARACHA



SCHOOL OUGHT TO BE AN AD-FREE ZONE...



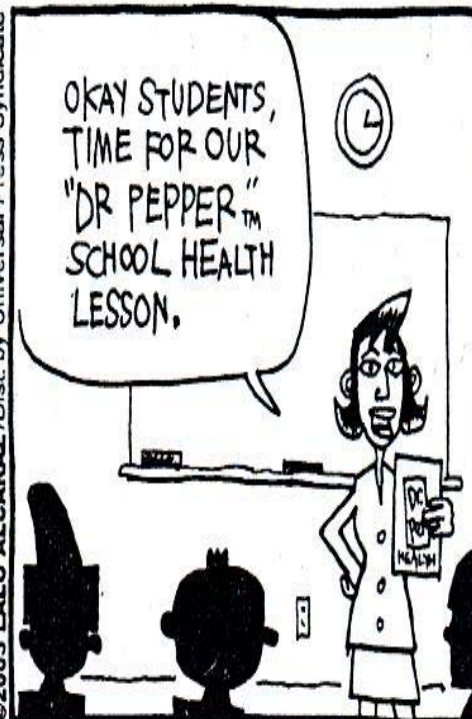
LALO ALCARAZ

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By Lalo Alcaraz

OKAY STUDENTS, TIME FOR OUR "DR PEPPER" SCHOOL HEALTH LESSON.



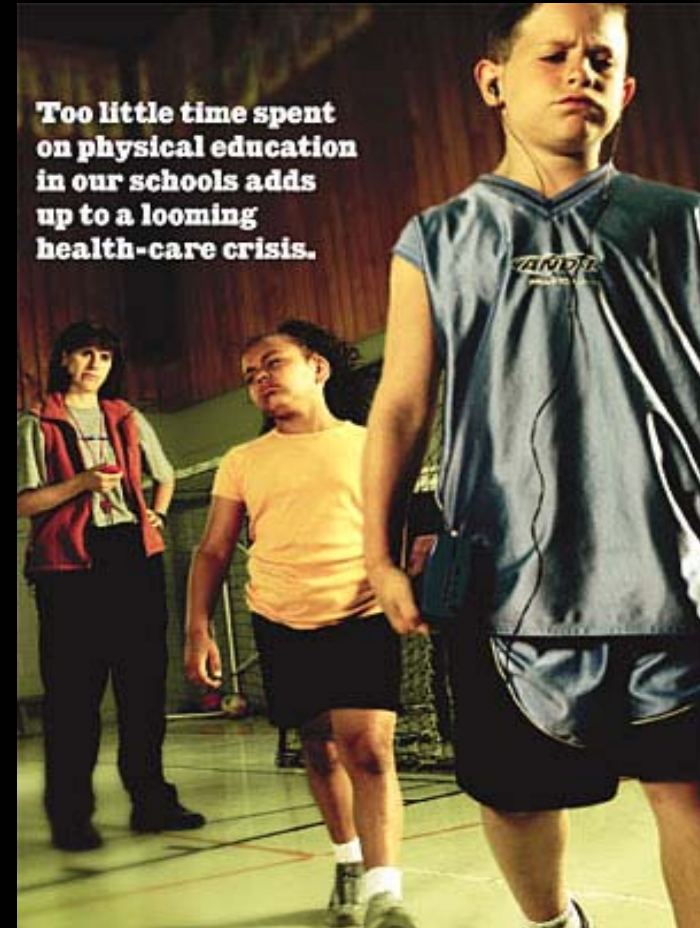
We Don't Have To Expend Much Energy

- We have created conditions that allow us to avoid exertion at work, in travel, & in entertainment.
- We do little to promote exercise at school or in our communities.

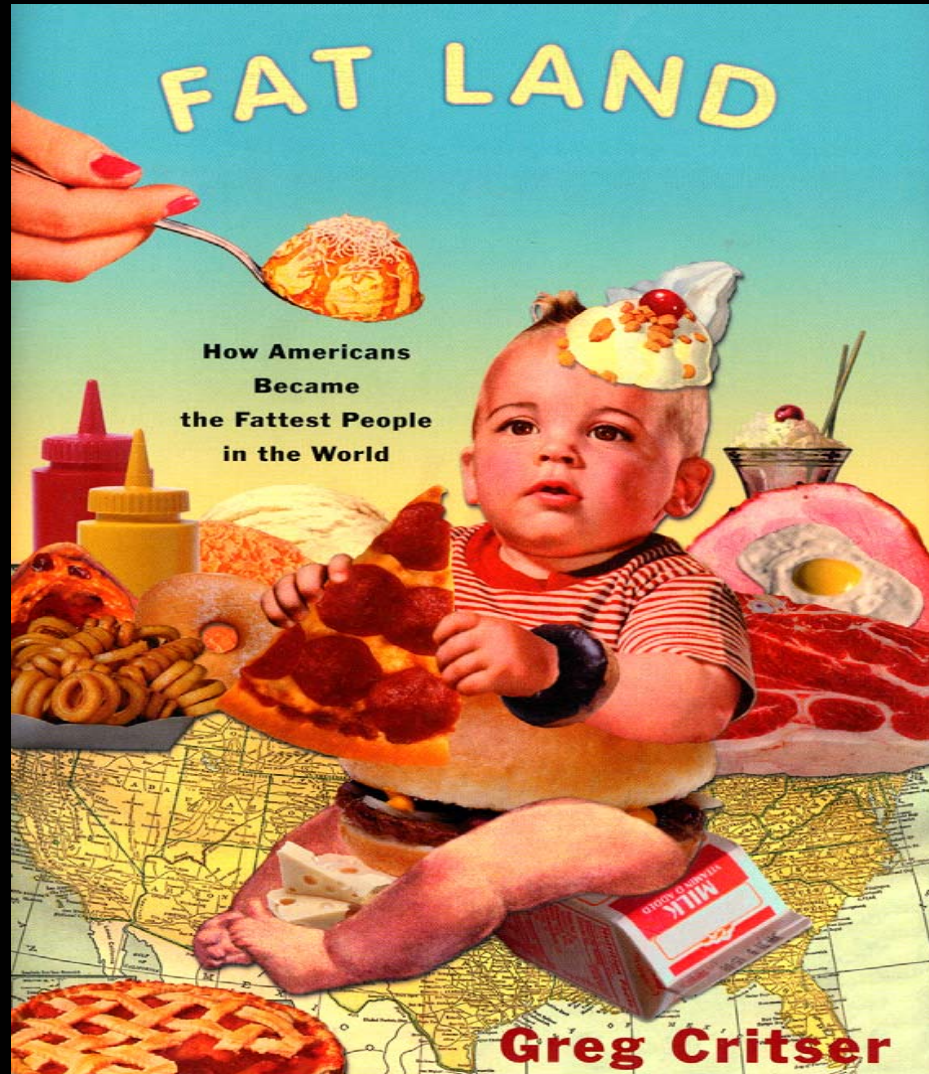


School Children Exercise Less

- Budgets for PE & athletics have been reduced.
- Requirements for physical fitness have been reduced or abandoned at many schools.



Read More About It



Is Losing Weight Worthwhile?

- Modest reductions in weight improve obesity-related conditions
 - In the Framingham Study, 10% weight loss corresponded to 20% lower CAD risk.
 - Another study projected that a 10% weight loss would reduce the number of years with DM, hypertension, hypercholesterolemia, & CVA, & increase life expectancy by 2-7 mo.

Physiological Control of Appetite, Body Fat, & Weight

- Body weight is determined by the long-term balance between energy intake (food) & energy output.
- Energy output is the sum of our basal metabolic rate (BMR) & energy expended by exercise.
- The amount of food we eat & our BMR are regulated by the hypothalamus.

The Control of Weight Is Complex

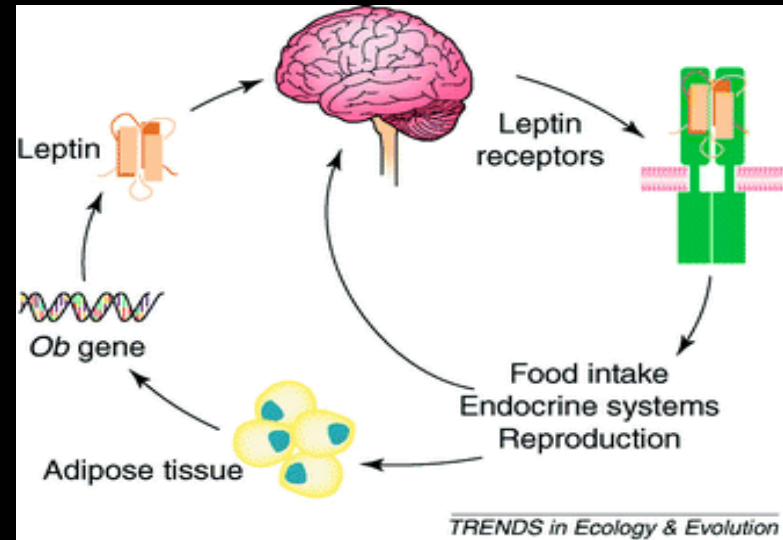
- The hypothalamus is the command center for weight control. It regulates appetite, eating behavior, BMR & fat metabolism.
- Many hormones are involved in weight control, including adrenaline, glucocorticoids, insulin, leptin, ghrelin, CCK, insulin, NPY, & α -MSH.

Regulation of Weight

- With fasting, hormones (e.g. ghrelin) acting on the hypothalamus to stimulate appetite & food seeking behavior while reducing BMR.
- With eating, hormones produce a feeling of satiety & promote energy storage.
- The hypothalamus is kept informed of energy stores (fat) by leptin.

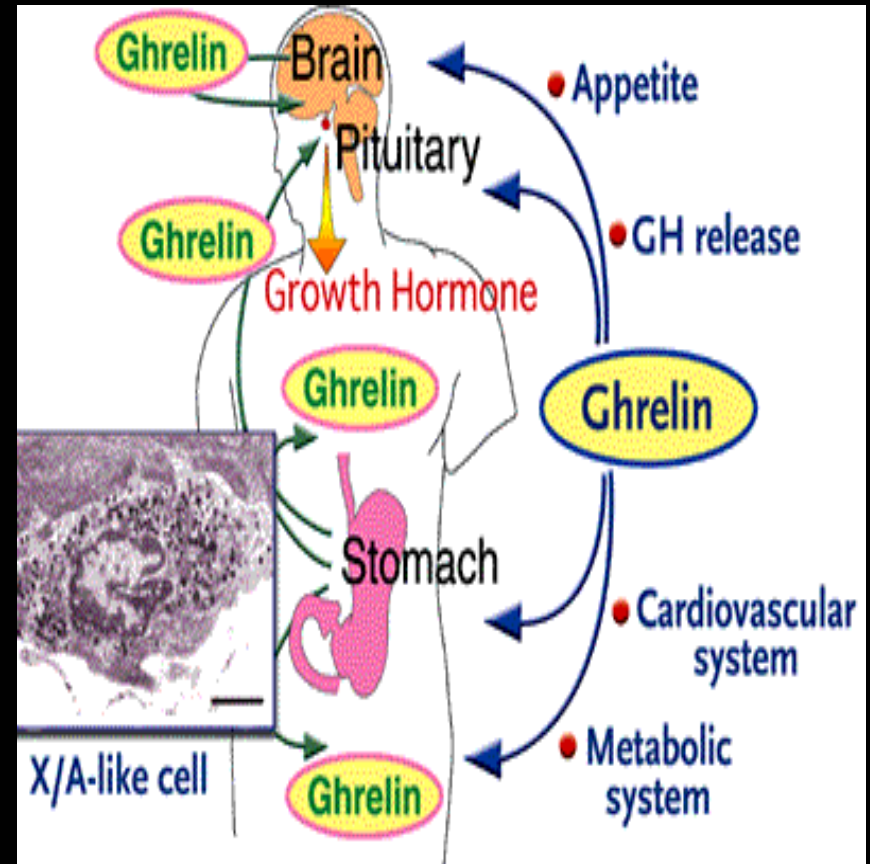
Leptin

- Leptin is produced by fat cells. It signals the hypothalamus to reduce eating when fat stores are OK.
- Mice deficient in leptin become obese.
- Obese humans have leptin resistance.



Ghrelin

- Ghrelin is produced in the stomach & duodenum.
- Ghrelin rises during fasting. It stimulates eating behavior through the hypothalamus.



Why Is It Hard To Lose Weight By Dieting?

- The body interprets dieting as starvation, even if we are fat.
- The body resists weight loss (from its current level) by increasing appetite & reducing BMR.
- Reducing food intake is very difficult in the modern environment because we are surrounded by food & ads for food.

The Body Interprets Dieting As Starvation And Adapts

© 1998 Randy Glasbergen.
www.glasbergen.com



“When you deprive your body by dieting, it may interpret this as starvation and adapt as necessary to survive.”

Dieting & Weight Loss

- On the average, low calorie diets reduce weight by an average of 8% over 3 to 12 months.
- In the long term, most patients regain the weight they lose.
- There is little hard data about the relative benefits of various diets- low fat (Pritikin) vs low carbohydrate (Atkins).

Exercise & Weight Loss

- Exercise is important, but it isn't enough.
- BMR may decrease with exercise, but
- Exercise improves lean body mass.
- Exercise helps to maintain weight loss.



Drugs & Weight Loss

- Drugs may reduce food intake, increase BMR, & reduce food absorption.
- Three drugs have been proven safe & effective for weight loss- phentermine (e.g. Fastin), sibutramine (e.g. Meridia) and orlistat (Xenical).
- Sibutramine & orlistat are approved for long-term use, phentermine for short-term

How Do Drugs Work?

- Phentermine inhibits norepinephrine re-uptake into neurons. The increase in sympathetic tone raises BMR & decreases appetite.
- Sibutramine inhibits both norepinephrine and serotonin reuptake.
- Orlistat blocks the action of pancreatic enzymes on fat digestion.

How Well Do Drugs Work?

- Weight loss increases from about 5-10% with diet alone to about 10-15% with diet and medication (sibutramine, orlistat).
- Weight is usually regained when the drugs are stopped.
- Side effects of drugs are common. Little is known about side effects of long-term use.

Behavior Modification

- Behavior modification- adopting new habits of eating and exercise- is very important for weight loss.
- Diet, exercise, & medications all work better when combined with structured behavior modification, such as that offered by programs like Weight Watchers.

Weight Control with Diet, Exercise & Behavior Modification

- It is very hard to lose more than about 10% of body weight. It's much easier to avoid gaining weight than to lose it!
- Regaining weight is very common.
- Changes in diet, exercise, & other behavior have to become lifelong habits!

Morbid Obesity

- Morbid obesity is defined as an excess of 100 lbs over ideal body weight, a BMI of over 40, or a BMI of over 35 with related medical problems, such as diabetes or obstructive sleep apnea.
- Diet, exercise, & drugs are rarely effective.
- Surgery can be effective for morbid obesity.

The Use of Surgery for Weight Loss Is Increasing Rapidly

- due to the increasing prevalence of morbid obesity, recognition of the morbidity of severe obesity, & improvements in surgical procedures.
- 47000 Sx were done in 2001, 63000 in 2002. 98000 will be done in 2003.
- 15-20 weight loss surgeries are done every week at Baylor Hospital in Dallas.

NIH Consensus Statement 1991

Gastrointestinal Surgery for Obesity

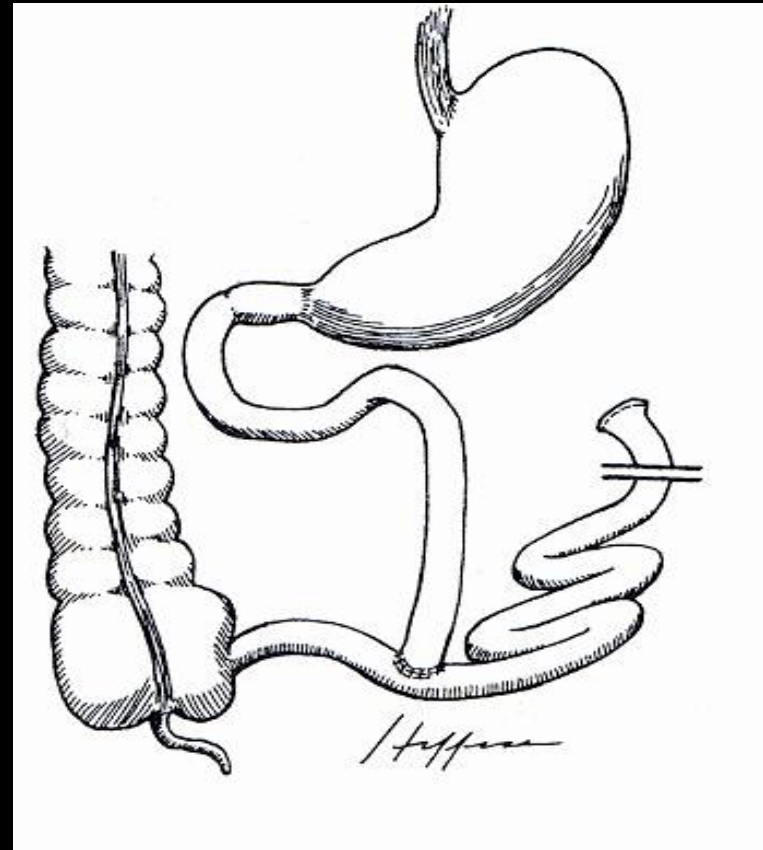
- The NIH recommended considering surgery for patients failing medical weight loss & with BMI >40 or BMI 35-40 & high-risk co-morbidities.
- The NIH recommended evaluation by a multidisciplinary team, education about risks, need for lifelong changes in diet & lifestyle as well as lifelong follow-up

Types of Weight Loss Surgery

- Malabsorption Procedures
 - Jejunioileal Bypass
 - Bilio-pancreatic diversion
- Gastric Restrictive Procedures
 - Gastroplasty
 - Gastric Banding
- Roux-en-Y Gastric Bypass

Jejunum-Ileal Bypass

- Proximal 15 in of jejunum connected to distal 10 in of ileum.
- Wt loss was dramatic due to malabsorption & diarrhea worsened by eating.
- 100K done in 1970s.

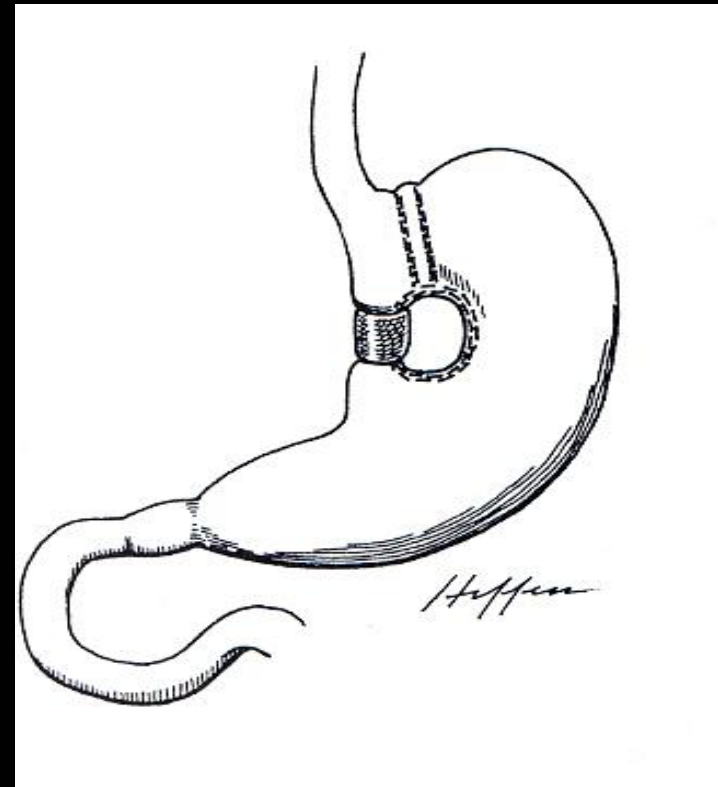


JI Bypass Complications

- Complications included:
 - Fluid & electrolyte depletion
 - Vitamin A, D, and K depletion
 - Osteoporosis
 - Kidney stones
 - Joint pain
 - Fatty liver & cirrhosis, with death!
- Abandoned. Most have been reversed.

Vertical Banded Gastroplasty

- 15-30 ml gastric pouch is made using proximal lesser curve.
- The pouch is unlikely to stretch with time.
- A band prevents stretching of the stoma (opening).



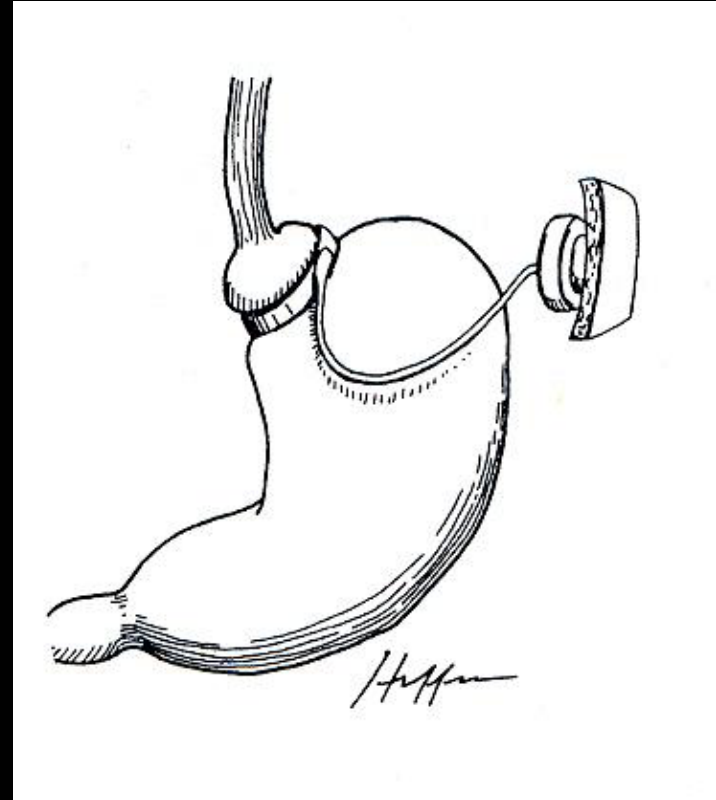
VBG

Advantages & Disadvantages

- VBG is a purely restrictive procedure.
- No malabsorption occurs. Pts have a low risk of vitamin & mineral deficiency.
- Patients can “cheat” by eating high sugar liquid or soft foods.
- The band reduces stoma stretching, but stenosis & erosion can occur.
- Few VBGs procedures are done in U.S.

Adjustable Gastric Band (Lap-Band)

- A band is placed around the proximal stomach.
- A balloon in the band is connected to a reservoir under the skin.
- The tightness of the band can be adjusted.



Gastric Band

Advantages & Disadvantages

- Gastric bands can be placed with laparoscopy, which is easier for patients.
- Commonly done & good results in Europe, but US trials not as favorable.
- Complications common in US trials: erosion, slippage, leak, reservoir problems, poor weight loss. Removal is commonly required.

Gastric Band Reservations

- Weight loss surgery is very profitable for surgeons.
- Since the Lap-Band is easy to place, some surgeons may be tempted to offer it even if they do not have:
 - Training & skills to do other weight loss procedures &
 - A multidisciplinary team to evaluate, educate, & support patients.

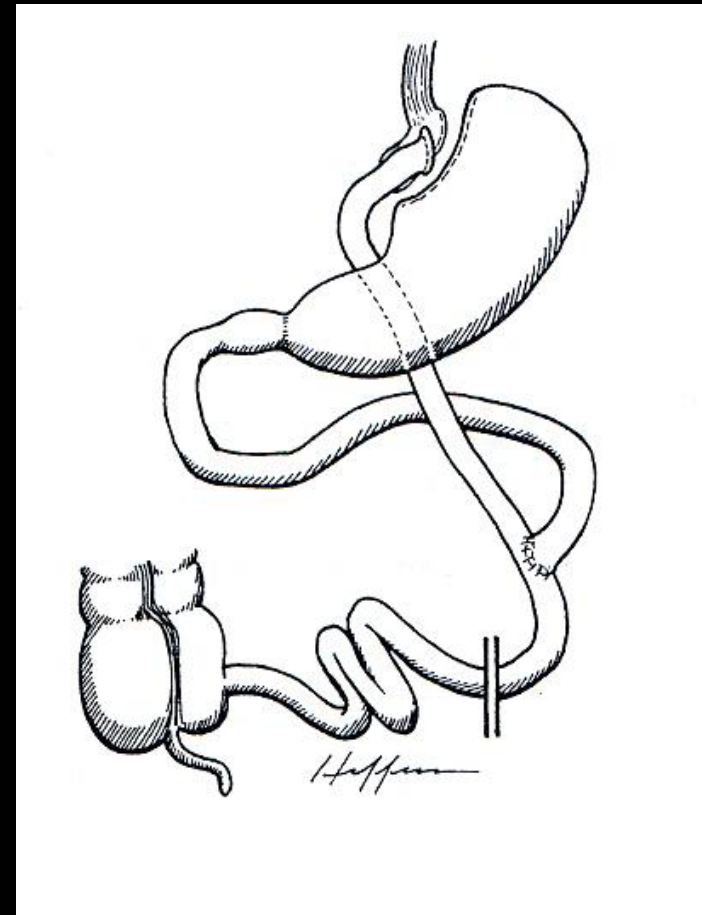
VBG & Gastric Banding

The SOS Study

- The Swedish Obese Subjects Study is a large, long-term, prospective, matched (not randomized) comparison of surgical vs. medical Rx for obesity.
- VBG & gastric banding were used in 90% of the SOS Study patients.
- In the 6 year report the mean excess weight loss was low- about 17%.

Roux-en-Y Gastric Bypass

- A 15 to 30 ml proximal stomach pouch is created.
- A 75 cm Roux-en-Y limb of jejunum is joined to the gastric pouch,
- Primarily restrictive; dumping; limited malabsorption



RGB

Advantages & Disadvantages

- The Gold Standard
- Extensive long-term experience from many centers.
- Initial loss 65-75% of excess weight, with loss of 50-60% maintained @ 10 years
- In 3 randomized trials, RGB has been shown to result in more weight loss than VBG or gastric banding.

Laparoscopic Vs Open Surgery

- Time in hospital & time to return to normal activities are significantly shorter after laparoscopic than after open surgery.
- Incidence of incisional hernias is reduced.
- Other complications are the same.
- Laparoscopic RGB is technically demanding. It requires training & experience.

Complications of Surgery

- Death occurs in about 1% of patients
- Other surgical complications in about 10%
 - Blood clots in the legs & lungs as well as respiratory problems
 - Suture line breakdown & leak
 - Wound infections
 - Intestinal obstruction
 - Intestinal bleeding

Later Complications

- Narrowing of the stoma->vomiting & plugging; other bowel obstruction
- Gallstones- risk reduced by ursodiol Rx for 6 months post-op
- Incisional hernias- common after open procedures, much less common after laparoscopy
- Depression during the adjustment period

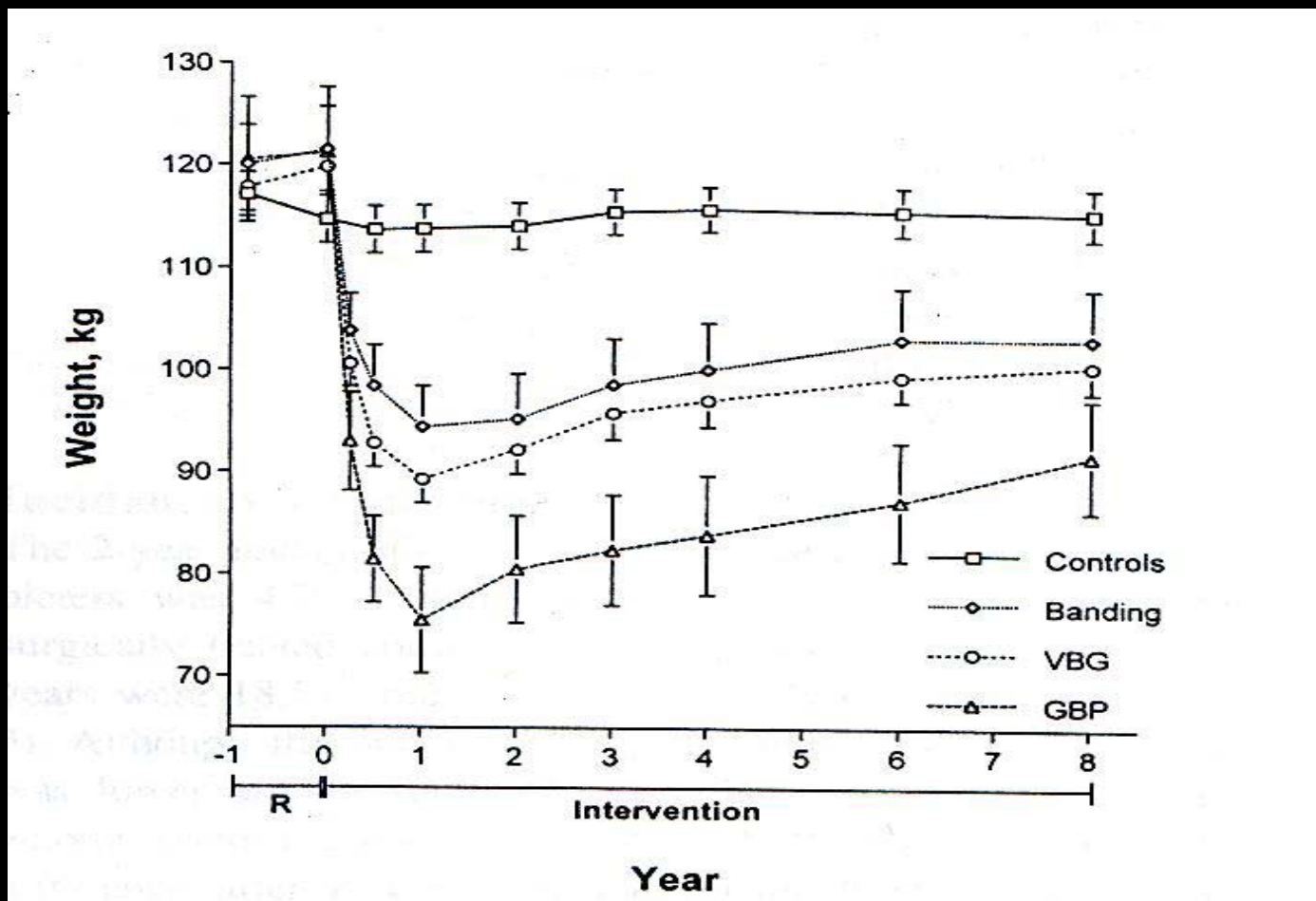
Nutritional Complications

- Uncommon after VBG & gastric banding; common after roux-Y gastric bypass
- Iron deficiency in up to 90% of young women & 50% of patients overall, if not given supplemental oral iron.
- Vit B12 deficiency occurs in about 35%.
- Calcium malabsorption occurs, & metabolic bone disease is a concern.

How Much Weight Do Patients Lose?

- Weight loss is rapid in the first year after surgery. Most patients stop losing weight by 12-18 months. After RGB, the mean excess weight loss is about 65-75%.
- Many patients regain some of the lost weight- a mean of 30% of the excess weight loss.

Weight Loss After Surgery The First 8 Years



Does Weight Loss Surgery Improve Associated Conditions?

- The risk of DM was reduced from 19% to 4% in the SOS Study. In another series, 90% of patients with overt DM or glucose intolerance improved to normal.
- In most studies hypertension is improved, but not in the SOS 8 year follow-up.
- High cholesterol & triglycerides improve.

Improvements In Associated Conditions

- No long-term data on heart disease.
- Preliminary data suggest benefit for NAFL
- Obstructive sleep apnea improves.
- Irregular menstrual function & fertility improve.
- Quality of life is often dramatically better very early.

Insurance Requirements Weight Loss Surgery

- Coverage & requirements vary.
- Almost all use the NIH Consensus Conference Criteria for eligibility.
- Usually require documentation of failure to lose weight in a medically supervised program(s) (other than the surgery program) of a specified duration.

Weight Loss Surgery Is An Aid To Lifelong Dieting

- Weight loss surgery will fail if patients are not committed to lifelong dieting.
- Gastric restriction, dumping, & diarrhea with malabsorption aid dieting by discouraging intake of excessive amounts of food or high calorie foods.

A Good Program Is Important

- Trained & experienced surgeons are critical to a successful outcome.
- Weight loss surgery should be part of a comprehensive program that includes:
 - Comprehensive pre-op evaluation & teaching
 - Dietary, exercise, & psych counseling pre op & post op
 - Commitment to lifelong follow-up of pts

An Ounce of Prevention Is Worth A Pound Of Cure

- What can we do?
- It's much easier to avoid gaining weight than to lose it.
- We need to work on our own lifestyles as well as work to change our environment.
- We need to help our children learn healthy lifestyles.

Help Our Children Eat Healthy Food

- Improve nutrition education & school cafeterias.
- Get fast food & marketing out of schools.
- Lobby corporations to make food healthier.



Help Our Children Exercise

- Lobby for safe parks & playgrounds.
- Re-institute PE requirements.
- Lobby for school & community programs.
- Help kids turn off the TV & computer for a while!



Accept People The Way They Are

- Accept yourself the way you are, whether thin or overweight.
- Accept other people the way they are, whether thin or overweight.
- It's not necessarily our fault, and we can't all look like:



The Future Governor Of California?

