

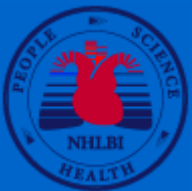
# Future Areas of Research

- Intervention Approaches
- Causes and Mechanisms of Overweight and Obesity
- Abdominal Fat, Body Weight and Disease Risk
- Assessment Methods



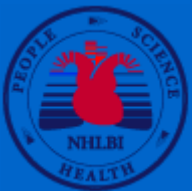
# Intervention Approaches

- Behavioral theory specifically addressing obesity treatment and prevention.
- Behavioral intervention methods and tools used in the primary care setting.
- Obesity treatment and prevention for culturally, ethnically, and socioeconomically diverse populations.



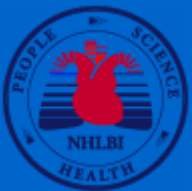
# Intervention Approaches

- Intervention methods to prevent weight gain with smoking cessation.
- Identification of individual characteristics that lead to successful long term weight loss.
- Optimal amounts of physical activity to promote weight loss, maintain weight loss, and prevent weight gain.



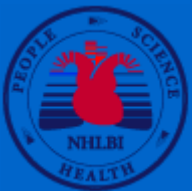
# Intervention Approaches

- Surgical interventions for weight loss (risks, nutritional adequacy, potential benefits, long term maintenance).
- Pharmacological interventions for weight loss.
- Environmental and population-based interventions.



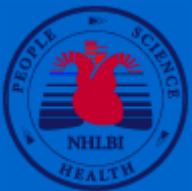
# Causes of Overweight and Obesity

- Regulation of energy balance (neuroendocrine factors that control energy intake, energy expenditure and differentiation of adipose tissue resulting from excess calories).
- Identification of genes important in human obesity. Gene-environment interactions.



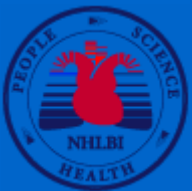
# Causes of Overweight and Obesity

- Role of environmental and behavioral influences on metabolic factors.
- Predictive factors to identify at risk populations (critical life periods).
- Influence of the intrauterine environment on development of obesity.



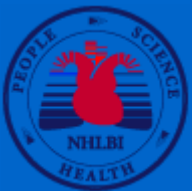
# Abdominal Fat, Body Weight and Disease Risk

- Influence of abdominal fat or other body fat compartments on health risk independent of total body fat.
- Studies should measure abdominal fat, as well as cardiorespiratory fitness to assess health improvement.
- Large prospective studies to evaluate the relationship of body mass index and body fat distribution to overall mortality.



# Assessment Methods

- Better methods to assess psychological, behavioral, and psychosocial variables related to behavioral risk factors for obesity.
- Good methods to economically and accurately assess energy intake and energy expenditure.
- Methods to assess culture, social integration and psychological stress.





## Future Areas of Research

- Intervention Approaches
- Causes and Mechanisms of Overweight and Obesity
- Abdominal Fat, Body Weight and Disease Risk
- Assessment Methods



After examining all of the evidence incorporated in the guidelines; the panel determined the following four research areas as key to learning more about the treatment and prevention of overweight and obesity. They include:

- Determination of various intervention approaches that would be most effective in both treating overweight and obesity as well as preventing them;
- Better understanding of the biological, genetic, and environmental causes of overweight and obesity and the mechanisms that play a role;
- More information on the relationship of body weight and fat distribution on increased disease risk; and,
- Development of better methods for assessing energy intake and energy expenditure.

## Intervention Approaches

- Behavioral theory specifically addressing obesity treatment and prevention.
- Behavioral intervention methods and tools used in the primary care setting.
- Obesity treatment and prevention for culturally, ethnically, and socioeconomically diverse populations.



Considerable research is needed on intervention approaches to treat and prevent overweight and obesity.

- Increased research on behavioral theory specifically addressing obesity treatment and prevention for all individuals, including children and adolescents, needs to be conducted.
- More research is needed on behavioral intervention methods conducted in various settings, particularly the primary care setting. Simple screening tools should be tested for their predictive value in achieving lifestyle modifications that lead to weight loss or weight control practices. Research is needed to identify appropriate and successful intervention content; for example, magnitude of weight loss goals (smaller change versus larger change), goals for the rate of weight loss (1 lb versus 2 lb per week), and initial weight loss goal of 5 percent plus an additional 5 percent, versus a single goal of 10 percent.
- Effective programs to treat or prevent obesity in culturally, ethnically, and socio-economically diverse populations need to be developed and tested.

## Intervention Approaches

- Intervention methods to prevent weight gain with smoking cessation.
- Identification of individual characteristics that lead to successful long term weight loss.
- Optimal amounts of physical activity to promote weight loss, maintain weight loss, and prevent weight gain.



- Intervention methods to prevent weight gain with smoking cessation are of particularly high priority in helping achieve smoking cessation. More research is needed to understand what methods work best.
- More research is needed on identifying the characteristics of individuals who have successfully maintained their weight loss over the long term.
- Of particular importance is research on the optimal amount of physical activity to promote weight loss, maintenance of weight loss, and the prevention of obesity. Also important are strategies which preserve muscle and bone in the face of weight loss.

## Intervention Approaches

- Surgical interventions for weight loss (risks, nutritional adequacy, potential benefits, long term maintenance).
- Pharmacological interventions for weight loss.
- Environmental and population-based interventions.



- Research on surgical interventions for weight loss should include evaluating surgical risk, including not only complications, morbidity, and mortality, but also long-term postoperative surveillance to monitor vitamin and mineral nutritional adequacy. Evaluation of the health benefits of weight loss from surgery should include changes in fat distribution; cardiorespiratory fitness; obesity-related comorbidities, including blood pressure, blood lipids, and glucose tolerance; and degree of success in long-term weight loss maintenance. Research is needed on techniques for integrating behavioral methods to promote long-term maintenance of weight loss after surgical treatment.
- Research on pharmacological interventions for weight loss should include evaluating changes in fat distribution, cardiorespiratory fitness, obesity-related comorbidities, and the degree of success of long-term weight loss maintenance. Better methods for investigating behavioral methods, along with pharmacological treatment, should also be investigated.
- Research is needed on environmental and population-based intervention methods, including community and school-based interventions, to augment public health approaches toward promoting weight maintenance and preventing obesity in the general population.

## Causes of Overweight and Obesity

- Regulation of energy balance (neuroendocrine factors that control energy intake, energy expenditure and differentiation of adipose tissue resulting from excess calories).
- Identification of genes important in human obesity. Gene-environment interactions.



In terms of the causes of overweight and obesity:

- The regulation of energy balance needs to be explored including the neuroendocrine factors that control energy intake, energy expenditure and differentiation of adipose tissue resulting from excess calories.
- The genes that are important in human obesity need to be identified. These include those that alter eating and physical activity behaviors, those that affect thermogenesis, and those associated with the co-morbidities of obesity.

## Causes of Overweight and Obesity

- Role of environmental and behavioral influences on metabolic factors.
- Predictive factors to identify at risk populations (critical life periods).
- Influence of the intrauterine environment on development of obesity.



- The roles of environmental and behavioral influences on metabolic factors important in obesity, as well as gene-environment interactions, need to be studied.
- Predictive factors should be examined to identify who is most at risk of developing obesity, and whether there are critical periods of life when these factors are most operative.
- The influence of the intrauterine environment on the development of obesity needs to be investigated, particularly to determine whether early deprivation leads to a later propensity for overweight and associated comorbidities, such as insulin resistance; or if high maternal weight gain and high birth weight are related to the risk of obesity and its comorbidities.

### Abdominal Fat, Body Weight and Disease Risk

- Influence of abdominal fat or other body fat compartments on health risk independent of total body fat.
- Studies should measure abdominal fat, as well as cardiorespiratory fitness to assess health improvement.
- Large prospective studies to evaluate the relationship of body mass index and body fat distribution to overall mortality.



The influence of abdominal fat independent of total body fat on health risk needs to be further defined.

- More information is needed on the relationship between differential body fat compartments and increased risk, the distribution of body fat compartments among various racial group populations, and the relationship between abdominal fat and disease risk in racial groups.
- Weight loss studies should include measurements of abdominal fat, as well as cardiorespiratory fitness, to better assess health improvement. Intentional weight loss treatments need to be examined in terms of their acute and chronic effect on the development and progression of diabetes, heart disease, and overall mortality.
- Large prospective studies are needed to evaluate the relationship of body mass index and body fat distribution to overall mortality .

## Assessment Methods

- Better methods to assess psychological, behavioral, and psychosocial variables related to behavioral risk factors for obesity.
- Good methods to economically and accurately assess energy intake and energy expenditure.
- Methods to assess culture, social integration and psychological stress.



- Much of the current research is hampered by the lack of good methods to accurately, objectively, and economically assess energy intake and expenditure, including physical activity, body composition and fat distribution, and behavioral and psychological variables.
- More research is needed to focus on measures to assess intake of fat and other dietary components, levels of physical activity, energy metabolism and body fat and visceral obesity.
- Better methods for assessment of psychological, behavioral, and psychosocial variables that may be related to behavioral risk factors for obesity (such as poor diet and inactive lifestyle) are needed, and particularly so for special population segments based on race, ethnicity, and socioeconomic status.