Topics

- Chris: Malnutrition and Neurological Function
- Chad: Nutrition and Mental State
- Carina: Eating Disorders – Causes
- Claire: Eating Disorders – Effects

Studies

- Researchers followed over 1,000 children for over 14 years.
- Studying their nutrition, behavior and cognitive development.
  - Research subjects included children of varied ethnicity.
  - Their behavior was gauged at school and at home

Malnutrition and Neurological Function

Chris Iglesias
The nutrients characterizing malnourishment in these circumstances.
- Zinc
- Iron
- Vitamin B
- Protein deficiencies.

All of these nutrients are linked to brain development.
These nutrients being associated as a result of lower IQ, leading to later anti-social behavior.

At ages 8, 11 and 17, parents and teachers gave feedback on how the children were behaving at home and in school.

Age 8
- The factors gauged were the child’s irritability and inkling to pick fights with other children.
- The children that were malnourished showed a 41% increase in aggression.
  - Compared to those that were not malnourished.

Age 11
- The reports were on how much the child lied, cheated, got into fights, bullied others, caused property destruction or used vulgarities
- A 10% increase in aggression and delinquency was shown at 11.
Age 17

- They assessed antisocial behavior, theft, drug use, property destruction and deliberate cruelty.
- A 51% increase in violent and anti-social behavior was shown.

Proper nutrition in the early postnatal years is being considered as a good first step to prevent adult violence issues.

- Malnourishment isn’t just a problem in developing countries.
- In the US iron deficiency is a problem.
  - 7% of toddlers are iron deficient.
  - Up to 9% and 16% in adolescents and female groups.

The cause of many psychological and behavioral problems is undetermined.
- However, malnutrition, especially in the earlier, developmental years of life, is considered a potential missing link in the cause of social and behavioral detriments.

Myelin

- Myelin is an electrically insulating phospholipid layer that surrounds the axons of many neurons.
- 80% lipid fat and 20% protein.
- It encases axons, permitting the transportation of messages from one axon to the next.
- The thicker and heavier the myelin sheath is, the faster and more effective the communication of the axons is.
Myelination

- The process in which the brain develops the myelin sheath is called myelination.
- The myelin sheath is laden with more cholesterol than any other component in the brain.
- Myelination happens in the first 4 decades of life, declining after that point.
- Some effects of an underdeveloped myelin sheath:
  - Autism
  - ADHD
  - Depression
  - Multiple sclerosis

In a research study administered on rodents during pregnancy and lactation:
- They were fed a synthetic diet containing a lipid derived from yeast.
  - Containing 50% odd-chain fatty acids.
- The offspring from the test subjects showed accelerated behavioral development associated with their increased myelin growth.
- There's a large chain of effects that can be caused by a damaged or underdeveloped myelin sheath:
  - Autism
  - ADHD
  - Depression
  - Multiple sclerosis

Omega Acids

- Neurotransmitters are a key to our brain's proper functioning.
- Without the proper protection from the myelin sheath, the messages sent between neurons through axons, can be slowed, causing mental disabilities.
- A study with animals has shown that diets lacking omega-3 fatty acids can cause problems with:
  - Learning.
  - Motivation.
  - Motor skills.
- A lack in this fatty acid can also affect the systems in the frontal cortex of the brain that use neurotransmitters.
- Omega-6 fatty acids are also important in proper brain function:
  - They affect the release of neurotransmitters.
  - Without the release of neurotransmitters the brain doesn't properly function, leading to a large array of problems.
**Key Terms**

- **Precursor** - A biochemical substance, such as an intermediate compound in a chain of enzymatic reactions, from which a more stable or definitive product is formed.

- **Receptor** - A molecular structure or site on the surface or interior of a cell that binds with substances such as hormones, antigens, drugs, or neurotransmitters.

- **Myelin** - Myelin is an electrically insulating phospholipid layer that surrounds the axons of many neurons.

- **Neurotransmitter** - A chemical substance, such as serotonin or dopamine, that transmits nerve impulses across a synapse.

**Neurotransmitters**

- There are 3 major groups of neurotransmitters:
  - **Amino Acids**
  - **Peptides**
    - Various natural or synthetic compounds containing two or more amino acids linked by the carboxyl group of one amino acid to the amino group of another.
    - Certain food proteins such as gluten, casein, egg protein, and spinach protein are broken down, and opioid peptides are formed.
  - **Monoamines**
    - Contain one amino group that is connected to an aromatic ring by a two-carbon chain.
    - Derived from aromatic amino acids like phenylalanine, tyrosine, histidine, tryptophan, and thyroid hormones.

- Zinc is also considered a neurotransmitter by some.

**Neurotransmitter Effects**

- They are determined by its receptor in the brain.

- Creating excitatory or inhibitory actions, depending on the receptor they bind to.

- Neurotransmitters are the backbone to the central nervous system and proper brain functioning.

**Dopamine**

- One of the neurotransmitters that is associated with learning and motor sequences, is released in the brain when a reward or pleasurable experience happens.

- Naturally, teaching us to repeat those behaviors that caused that effect.

- Dopamine is manufactured in the brain inside dopamine neurons from the amino acid precursor, tyrosine, one of the 20 commonly found amino acids in animal proteins.
Serotonin

- Another neurotransmitter, derived from tryptophan, an amino acid derived from protein during digestion.
- It is associated with depression, learning, body temperature, sexuality, sleep and even appetite.
  - Serotonin is synthesized in the gastrointestinal tract, and about 90% of it is stored in the intestines.
  - Pineapple, bananas, plums and some legumes are all good sources of tryptophan.

Due to the relatively new nature of the concept of nutrition effects on psychology, there haven’t been many studies examining the direct psychological effects that nutrition can have.

At a Children’s Nutrition Center in Arkansas, the USDA began a research project in October of 2004 with the goal to determine the effects of diets on psychological and psychoneurophysiological development and brain function in infants, toddlers and school children.

- Assessments will be used to evaluate central nervous system functions.
- Nutritional status will be assessed by urine and blood analysis and anthropometric measurements.
- The planned end date for this is September of 2009.

Sources

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- http://www.answers.com/axon
Food Fight !!!! Against Depression and Fatigue

Depression and Fatigue

- **Depression** - A mental state characterized by a pessimistic sense of inadequacy and a despondent lack of activity.
- **Fatigue** - A feeling of weakness, tiredness, or lack of energy.

Depression has many causes:
Here are some:
- Genetic
- Biochemical
- Mental and Emotional
- Spiritual and Social
- Combination

Fatigue has many causes:
Here are some:
- Sleep disorders
- Allergies
- Hypothyroidism
- Depression

Fatigue accompanies diseases such as:
- AIDS, Mononucleosis, Cancer, Anorexia
What should someone do if they are suffering from fatigue or depression?

Seek treatment from a qualified professional!

What home remedies may help with fatigue and depression?

Here are some things to consider:

- Follow a healthy, nutritious diet
- Add Omega-3 fatty acids
- Get your Vitamins and Minerals
- Balance your blood sugar
- Drink water

Nutritional?
1. Follow a healthy, nutritious diet
- Eat in moderation
- Eat an adequate diet
- Eat a balanced diet
- Eat a variety of foods
- Choose foods high in nutrient density

2. Add Omega-3 fatty acids to diet
- Highly concentrated in the brain
- Crucial for brain development
- Important for cognitive and behavioral function
- DHA and EPA- forms of Omega-3
- Get them from: Leafy, green vegetables, flax seed, soy products, and fish such as salmon, tuna, mackerel, herring

Get your Vitamins and Minerals
- Thiamin (B1)
- Cyanocobalamin (B12)
- Folate(B9)
- Pyridoxine (B6)
- Iron

Thiamin (B1)
- Essential for the body to be able to use carbohydrates as an energy source as well as for metabolizing amino acids.
- Causes of deficiency: poor diet, body's inability to absorb it, and is connected to alcoholism.
- Symptoms of deficiency include mental depression, nervous exhaustion, and insomnia.
- Some food sources: Peas, Spinach, Liver, Whole grain breads and cereals.
Cyanocobalamin (B12)
- **Essential** for normal nervous system function and blood cell production.
- **Causes of deficiency**: poor diet, body’s inability to absorb it, and alcoholism.
- **Symptoms of deficiency** include paleness, shortness of breath, fatigue, memory loss, disorientation, weakness.
- **Some food sources**: Meat, fish, dairy, eggs. Vegetarians need to be careful.

Folate (B9)
- **Essential** for maintenance and production of new cells.
- **Causes of deficiency**: poor diet, body’s inability to absorb it, some seizure medications, and alcoholism.
- **Symptoms of deficiency** include irritability, lack of energy, and decreased appetite.
- **Some food sources**: Leafy greens, citrus fruits, fortified breakfast cereals.

Pyridoxine (B6)
- **Essential** for synthesis of blood cells, carbohydrate and amino acid metabolism.
- **Causes of deficiency**: poor diet, kidney failure, use of oral contraceptives (women), and alcoholism.
- **Symptoms of deficiency** include anemia, depression, confusion, convulsions.
- **Some food sources**: Enriched cereals, meat, fish, soy, and white potatoes.
- **Low levels of Pyridoxine and Riboflavin** are found in high percentages in clinically depressed individuals.

Iron
- **Essential** for carrying oxygen effectively throughout the body for normal functioning of every cell in the body.
- **Causes of deficiency**: poor diet, body’s inability to absorb it, and loss of blood.
- **Symptoms of deficiency** include irritability, shortness of breath, fatigue, and weakness.
- **Some food sources**: Red meat, liver, bread, fortified cereals.
Balance your blood sugar
- Fuel up with a healthy breakfast.
- Keep an even supply of food in your system.
- Limit refined sugar and refined carbohydrates.
- Limit alcohol and caffeine.
- Exercise.

Drink Water
- 75% of Americans are chronically dehydrated.
- Dehydration is the #1 trigger for daytime fatigue.
- Limit alcohol and caffeine.

Eating Disorders: Causes
Carina Wolff

[Image: http://centi.deviantart.com/]

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Eating Disorders: Causes

What can lead a person to destroy their body through severely disordered eating?

Causes of Eating Disorders

- Mindset: the overall cause, made up of other factors
- Family Structure
- Relationships and Social Pressure
- Media and Cultural Pressure
- Previous Eating Habits

Note: eating disorders are influenced by many integrated factors – it is impossible to pin them on only one cause.

Mindset: Anorexia Nervosa

People who become anorexic often were good children - eager to please, conscientious, hard working, and good students. Typically they are people-pleasers who seek approval and avoid conflict. They may take care of other people and strive for perfection, but underneath they feel defective and inadequate. They want to be special, to stand out from the mediocre masses. They try to achieve that goal by losing weight and being thin.

~ http://www.anred.com/who.html

Mindset: A. Nervosa

- Extreme phobia of being, or being perceived as fat
- Fear of losing control of their weight and what they eat
  - Fear of losing control of themselves – actions, relationships, emotions
- Distorted body image
- Low self-esteem and self-efficacy
- Binary mode of thought – sees world in terms of fat and thin
  - Self-evaluation largely, or even exclusively, in terms of their shape and weight
  - Thin = happy or perfect – individual strives to reach happiness through starvation to reach their “ideal weight”
Mindset: Bulimia Nervosa

People who become bulimic often have problems with anxiety, depression, and impulse control; for example, shoplifting, casual sexual activity, binge shopping, alcohol and drug abuse, and cutting and other self-harm behaviors. They do not handle stress gracefully. They may be dependent on their families even though they fiercely profess independence. Many have problems trusting other people. They have few or no truly satisfying friendships or romantic relationships.

~ http://www.anred.com/who.htm

Mindset: B. Nervosa

- Obsession with food, weight and body image
- Highly negative and/or distorted body image
  - Low self-esteem
  - Depression
  - Feeling of lack of control
- Extroverted, attention-seeking or compulsive behavior – need for acceptance or approval from others
- Binary mode of thought – sees world in terms of fat and thin
  - Self-evaluation largely in terms of their shape and weight
  - Thin = happy or perfect – individual blames their unhappiness on their weight, falling into the vicious cycle of bulimic behavior

Trends in Thought

- Equating success or acceptance in society with being excessively thin
  - Desire for acceptance and approval from others
  - Loneliness and feelings of isolation
- Superficial self-evaluation and very low self-esteem
- Food and weight-control as method of coping with emotional problems
- Anxiety or mood problems
  - Pre-occupation or obsessive thoughts about food and weight
  - OCD (obsessive compulsive disorder)
  - Clinical depression or chronically low mood
  - Moodiness or ‘mood swings’

Family Influences

Some people with eating disorders say they feel smothered in overprotective families. Others feel abandoned, misunderstood, and alone. Parents who overvalue physical appearance can unwittingly contribute to an eating disorder. So can those who make critical comments, even in jest, about their children’s bodies.

~ http://www.anred.com/causes.html
Family

- **Acceptance**
  - Children desire acceptance and will sometimes associate a lack of acceptance or approval with their weight. They feel like they can’t be good enough and associate thinness with goodness. They may also fear criticism and desperately try to avoid it.

- **Discipline**
  - A rigid structure of family discipline, with unreasonably high expectations for success, little recognition of success, or a practice of emotional restriction can lead to deep feelings of inadequacy, or the idea that emotions have to be repressed, which necessitates some method of coping.

- **Attention**
  - Lack of communication with parents, as well as physical or emotional distance from parents, can lead to desire for attention and approval, as well as increased feelings of inadequacy and a feeling that everything done is meaningless. “They don’t notice me, so there must be something wrong with me.”

Family (cont’d)

- **Abuse**
  - Children with a history of physical, emotional or sexual abuse often turn to starving or stuffing as a method of coping or cleansing themselves. Feeling unclean and disgusted with oneself can also increase the risk of developing an eating disorder.

- **Eating**
  - Disordered eating and/or chronic dieting in the family do not provide a healthy example for a child or adolescent. Sometimes this can increase the desire to be in control of eating, or create an obsession with weight and size that can lead to eating disorders.

- **Biology**
  - Eating disorders also tend to run in families, with female relatives most often affected. For example, a girl has a 10 to 20 times higher risk of developing anorexia nervosa, for instance, if she has a sibling with the disease.

Pressure, pressure and more pressure:

- **In School**
  - As children, and in later years, there is a desire for acceptance from friends and peers in school.
    - If an individual feels ostracized, harassed or isolated, then that desire is only increased, and feelings of low self-worth can lead to depression and withdrawal from society.
    - The individual may try to use controlling their weight as a means of gaining the acceptance or recognition of their peers.
  - Groups of kids also start ‘diets’ together sometimes, comparing purging tips and ways to restrict food intake.
    - This is behavior that gives them a much higher risk of developing eating disorders, since they seek acceptance among each other, and enforce the idea that acceptance should be based on weight.
In sports:
- Sports are prime ground for eating disorders.
  - In rowing, wrestling, gymnastics, figure skating, any sport that places an emphasis on weight or shape offers eating disorders opportunities to worm themselves into people’s minds.
- Coaches and peers may offer unhealthy pressure to be very thin, or “fit,” offering tips and diets that are often terribly unhealthy for active individuals.
  - The athletes are acutely aware that they are judged based on their weight and shape, which dramatically increases pressure to stay skinny.

At Work:
- Stress placed on people by society to fit the ideal professional image pressure women to lose weight may lend themselves to body-image problems.
  - There may be size-discrimination at a job that makes prospects for promotion seem dim without weight loss and can lead to further body-image problems.
- Comments, gossip and whispering about a person’s weight will make them feel worthless and cause them to seek acceptance.
  - It can make the person feel depressed and alone, and enforce negative body-image and weight issues.

At Work (cont’d)
- Bosses telling employees to watch their weight or loss weight in order to keep their job, or to get a promotion can lead to feelings of inadequacy and powerlessness.
- Sexual harassment on the job will lead its victims to self-worthless feelings, confusion, and additional feelings of inadequacy and powerlessness.
  - Victims often blame themselves and turn to food as a method of coping.

In Romance:
- I have to look my best!
  - In romantic relationships, there are often a lot of stresses that can lead to low self-esteem and image, especially since feeling attractive to a romantic partner is such a major part of many love relationships, especially among teenagers.
    - These feelings of unattractiveness are often mentally linked to body weight.
- But I’m too fat to get a date...
  - Harassment about weight can lead to low self-esteem and obsession over weight, which often leads to disordered eating.
- Why wasn’t I good enough?
  - A cheating partner can also make the other feel inadequate, ugly and foolish. It can lead to depression.
    - This can easily translate into an obsession with weight and body-image.
Media and Social Pressure

"400-600 advertisements bombard us everyday in magazines, on billboards, on TV, and in newspapers. One in eleven has a direct message about beauty, not even counting the indirect messages."

~http://www.about-face.org

Media Influence

It is interesting to note that I found these two photos in under two minutes. I could not find a good-quality photo of a healthy-weight woman in over half an hour of searching, with many different keywords.

Media Influence (cont’d)

- Media imagery promotes an unreasonable and often unattainable standard for the “ideal” weight.
  - This ideal, that near-emaciation is beautiful, can be highly destructive, as it tells people that the airbrushed, starved people on TV and in magazines possess a type of “beauty” that they can, and should, attain.
  - It only enforces the kinds of thoughts that victims of eating disorders experience.
- There is also a strong cultural aspect of the pressure in the media.
  - Manipulating food and body weight is encouraged by Western culture, which exhorts all of us, and especially women, to improve ourselves by “fixing” the external package, the body.

Media Influence (cont’d again)

- Adolescents and children sometimes find it hard to understand that the standards of beauty projected by the media are unreal and unreasonable.
  - This can lead to feeling ugly and fat, worthless or incapable (of achieving beauty): a negative and often destructive self-image.
  - Striving to reach that ideal can be destructive and dangerous, and can lead to disordered eating, self-loathing and, ultimately, to the eating disorders themselves.
Media: (additional text)

- Make-over reality shows on TV are a prime example of media pressure. "Change your hair, buy new clothes, put on some makeup, buy fancy new shoes, tone your muscles and LOSE WEIGHT and you will be happy, admired, and loved" -- an instant new identity. The problem is that "fixing up" the outside (or starving it to death) cannot possibly fix what’s wrong on the inside. True happiness and contentment are achieved through psychological and spiritual growth and the genuine realization of one’s true worth and place in the world, not by abusing the body. It takes a lot of wisdom and maturity to realize and accept this truth, and the young people most vulnerable to eating disorders are those who most lack those characteristics. Nevertheless, in a culture where obesity is such a major issue, and a problem on the rise, the images that say thin=pretty are also prevalent.
- We have to ask ourselves, how reasonable is this? The American lifestyle and commonly accepted standards of beauty are almost directly contradictory. Media imagery promotes an unreasonable standard for the "ideal" weight. This ideal can be highly destructive, as it tells people that the airbrushed, starved people on TV and in magazines possess a type of "beauty" that they can, and should, attain. This only enforces the kinds of thoughts that victims of eating disorders experience. The standard set by the media is next to impossible to attain without starvation. Striving to reach that ideal can be destructive and dangerous, and can lead to disordered eating, self-loathing and, ultimately, to the eating disorders themselves. When this kind of behavior is encouraged in a society that also says "bigger is better" and promotes an extremely sedentary lifestyle as well, how reasonable is the expectation for people to be freakishly thin?

Social Pressure

"In order for a woman to consider herself happy, she has to be in a good relationship, be happy with her kids, her friends have to like her, her job has to be going well, her house has to look really good -- and she has to be thin."

~Professor Alice Domar, Harvard Medical School. Parade magazine, October 11, 2003

Social Factors

- Peer Pressure:
  - Sometimes, appearance-obsessed friends or romantic partners create pressure that encourages eating disorders.
  - Thinness equals success in the minds of many people, not only those suffering from eating disorders.
  - Sorority houses, theatre troupes, dance companies, school cliques, and other situations that pressure people to fit an image create more pressure.

Social Factors (cont’d)

- People vulnerable to eating disorders, in most cases, are experiencing relationship problems, loneliness in particular.
  - They may be withdrawn with only superficial or conflicted connections to other people.
  - They may seem to have exciting social lives filled with friends and social activities, but later will confess that they did not feel they really fit in, that no one seemed to really understand them, and that they had no true friends or confidants – no true intimacy in relationships.
  - Often they desperately want healthy connections to others but fear criticism and rejection if their perceived flaws and shortcomings become known.
Eating Habits and Genetics

- **Previous habits of disordered eating, such as chronic dieting or bingeing habits can lead to genuine eating disorders.**
  - Sinking into the unhealthy habits of disordered eating, combined with a negative self-image, depression or other mental distress, can facilitate the development of an eating disorder.
- **Genetics may play a role**
  - Although there is not conclusive evidence, there is speculation that some people have a genetic predisposition for having an eating disorder.
  - Scientists are still researching possible biochemical or biological causes of eating disorders. In some individuals with eating disorders, certain chemicals in the brain that control hunger, appetite, and digestion have been found to be imbalanced. The exact meaning and implications of these imbalances remains under investigation.
  - Eating disorders often run in families. Current research is indicates that there are significant genetic contributions to eating disorders.
“Eating Disorders are Serious, Potentially Life-Threatening Conditions that Affect a Person’s Emotional and Physical Health”

~National Eating Disorders Association

The Prevalence of Eating Disorders

- 80% of American women are dissatisfied with their appearance
- In the U.S., as many as 10 million females and 1 million males are fighting a life and death battle with an eating disorder

~National Eating Disorders Association

Anorexia Nervosa

- Refusal to maintain body weight
- Intense fear of gaining weight
- Disturbance in the way one experiences their weight/size

Sub-Types of Anorexia Nervosa

- **Restricting Type:** During episodes of anorexia, the person has not regularly engaged in binge-eating/purging behavior
- **Binge-Eating or Purging Type:** During episodes of anorexia, the person has regularly engaged in binge-eating or purging
Consequences of Anorexia Nervosa

- Cycle of self-starvation
- Body denied essential nutrients that it needs to normally function
- Body slows down all of its processes in order to conserve energy
- This slowing down of the body’s systems results in serious medical consequences and sometimes death

Medical Consequences of Anorexia Nervosa

- Abnormally slow heart rate
  - Very slow heart rate can cause:
    - Dizziness, lightheadedness, or shortness of breath
    - One may feel tired and find it harder to exercise
    - One may have chest pain or heart palpitations
    - One may feel confused or have trouble concentrating
    - One may faint if slow heart rate causes enough of a drop in blood pressure
- Low blood pressure
- Risk of heart failure (as heart rate and blood pressure levels drop)
- Reduction in bone density, which results in dry, brittle bones (osteoporosis)

Medical Consequences of Anorexia Nervosa cont...

- Muscle loss and weakness
- Severe dehydration (can result in kidney failure)
- Fainting, fatigue, general weakness
- Dry hair and skin (hair loss is common)
- Lack of menstrual periods
- Anemia
- Growth of downy layer of hair called lanugo all over the body, in an effort to keep the body warm
- Lack of nutrients, such as amino acids, which affect the neurotransmitters in our brain that affect our mood

Osteopenia and Osteoporosis

- Osteopenia is a condition in which a person’s bone minerals are below normal. This can lead to Osteoporosis.
- Osteoporosis is a thinning of the bones with reduction in bone mass.
- Osteopenia and Osteoporosis are due to a depletion of calcium and/or vitamin D.
- Hormone imbalance/deficiencies associated with the loss of the menstrual cycle can also increase one’s risk of both Osteopenia and Osteoporosis.
Osteoporosis as a Result of Anorexia

Normal Bone  Osteoporosis

Blood Problems
- Anemia is a common result of anorexia and starvation
- Pernicious anemia can be caused by severely low levels of vitamin B12
- In extreme anorexia, the bone marrow reduces its production of red blood cells resulting in a life-threatening condition called pancytopenia.

Neurological Problems
- Brain scans indicate that parts of the brain in people with anorexia undergo structural changes and abnormal activity. This can cause:
  - Seizures
  - Disordered thinking
  - Numbness or odd sensations in the hands or feet (called peripheral neuropathy)
- Some of these changes return to normal after weight gain, however there is some evidence that some damage to the structure of the brain may be permanent.
  - The extent of the neurological problems associated with anorexia nervosa is unclear

Anorexia Affects Your Whole Body
**Bulimia Nervosa**

- Recurrent episodes of binge-eating
- Recurrent inappropriate compensatory behaviors in order to prevent weight gain
  - Compensatory behaviors include: vomiting, misuse of laxatives, diuretics, or enemas; fasting or excessive exercise

**Sub-Types of Bulimia Nervosa**

- **Purging Type:** During the episode of bulimia, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas
- **Nonpurging Type:** During the episode of bulimia, the person has used other inappropriate compensatory behaviors, such as fasting or excessive exercise, but has not engaged in self-induced vomiting, etc.

**Consequences of Bulimia Nervosa**

- Recurrent binge-purge cycles
- These cycles can affect the entire digestive system
- Can lead to electrolyte and chemical imbalances
- This can affect the heart and other major organ functions, and can cause death.

**Medical Consequences of Bulimia Nervosa**

- During periods of bingeing, there is potential for gastric rupture
- Frequent vomiting can cause inflammation and possible rupture or tearing of the esophagus
- Frequent vomiting can cause stomach acids to be released with can cause tooth decay and staining
- Laxative abuse can cause chronic irregular bowel movements and constipation
- Peptic ulcers and pancreatitis (an inflammatory condition that occurs when pancreatic digestive enzymes become active within the gland and attack the pancreas itself)
- Electrolyte imbalances
Electrolytes

- Electrolytes are essential to the production of the body’s natural electricity. Electrolytes ensure:
  - Health teeth, joints, bones
  - Nerve and muscle impulses
  - Healthy kidneys and heart
  - Blood sugar levels
  - The delivery of oxygen to the cells

Electrolyte Imbalances

- Electrolyte imbalances can lead to irregular heartbeats and possibly heart failure and death
  - Electrolyte imbalance is caused by dehydration and loss of potassium, sodium, and chloride from the body as a result of purging behaviors

Electrolyte Imbalances cont...

- Electrolyte imbalances can cause:
  - Dehydration
  - Malnutrition
  - Low blood pressure
  - Extreme orthostatic hypotension (a sudden drop in blood pressure upon sitting up or standing)
    - Symptoms include dizziness, blurred vision, passing out, heart pounding and headaches
Gastrointestinal Problems

- Bloating and constipation are very common both in people with anorexia and those with bulimia.

How Bulimia Affects Your Body

Hormonal Changes (occur in both Bulimia and Anorexia)

- Reproductive hormones are lower
- Thyroid hormones are lower
- Stress hormones are higher
- Growth hormones are lower (children and adolescents with anorexia may experience retarded growth)

Health Consequences of Hormonal Changes

- Long term, irregular or absent menstruation
  - After treatment and weight increase, estrogen levels are usually restored and periods resume
  - In severe anorexia, even after treatment, 25% of patients never attain normal menstruation
  - Can cause infertility
Health Consequences of Hormonal Changes cont…

- Can contribute to bone loss
  - Low estrogen levels can cause a loss of bone minerals (osteopenia) and loss of bone density (osteoporosis)
  - Bone loss may be worsened by low calcium levels and by higher levels of stress hormones
  - Weight gain does not restore bone. Only achieving menstruation as quickly as possible can protect against permanent bone loss

Psychosocial/Psychological Effects

- Distorted perceptions and weight phobia become more pronounced
- Starvation Neurosis:
  - Cognitive processes center on food
  - Behavior includes toying with food and hoarding it
  - Coherent, creative thinking is impaired
  - Mental function is characterized by apathy, dullness, exhaustion, and depression

Psychosocial/Psychological Effects cont…

- Eating Disorders are often associated with mood disorders, anxiety disorders, and personality disorders
- Bulimia may be particularly associated with substance abuse problems
- Anorexia is often associated with obsessive-compulsive symptoms

Depression and Eating Disorders

- Depression is commonly associated with eating disorders
- Mood swings and depression can be caused by physiological factors such as electrolyte imbalance, hormone and vitamin deficiencies, malnutrition, and dehydration.
- Living with the eating disorder behaviors can often cause depression
- Depression can often lead the individual back into the cycle of the eating disorder