

**BULIMIA NERVOSA**  
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**1. General Considerations:**

- Bulimia nervosa (BN) is a syndrome defined by recurrent episodes of binge eating followed by inappropriate compensatory behaviors to prevent weight gain (such as self-induced vomiting, misuse of laxatives, enemas, diuretics or diet pills). There is a nonpurging type in which individuals compensate for increased caloric intake by episodes of fasting or excessive exercise.
- The diagnostic criteria for BN as defined in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) appears below.
- Body image in patients with BN unduly influences self-esteem and these individuals appear preoccupied by weight control.
- The refusal to maintain a minimally normal body weight, which is the hallmark of anorexia nervosa is not part of BN.
- BN is more common than anorexia nervosa but less easily detected as patients tend to be secretive about their behaviors and their weights tend to be normal. Two questions that have proven sensitive when used in the primary care setting for the detection of BN are: “Do you ever eat in secret?” and “How satisfied are you with your eating habits?”
- The prognosis for BN is better than for anorexia but some authors feel that 30% of pts with BN rapidly relapse and up to 40% remain chronically symptomatic.
- The prevalence in the USA is estimated to be 1-3% of young adults and growing. It is estimated that 15% of high school and college age students will exhibit bulimic behavior at some time during these years.
- The disorder is 10x more common in females than males.
- Peak onset is between the ages of 13 and 20.
- BN appears to have a chronic, sometimes episodic course, in which periods of remission alternate with binge/purge cycles.

## DSM-IV Criteria for Bulimia Nervosa

1. **Recurrent episodes of binge-eating. An episode of binge eating is characterized by both of the following:**
  - a. **Eating, in a discrete period of time (e.g. within a two-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.**
  - b. **A sense of lack of control over eating during the episode (e.g. a feeling that one cannot stop eating or control what or how much one is eating)**
2. **Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting or excessive exercise.**
3. **The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for three months.**
4. **Self-evaluation is unduly influenced by body shape and weight.**
5. **The disturbance does not occur exclusively during episodes of anorexia nervosa.**

### Specify type:

**Purging type:** during the current episode of bulimia nervosa, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

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

## 2. Psychiatric Comorbidity

- Major depression and BN occur together frequently although it is not yet understood if the mood disturbance is a consequence of the BN or a separate phenomenon.
- Bipolar disorder appears to be more frequent in patients with severe, chronic BN.
- 1/3 of patients with BN exhibit substance abuse behaviors, particularly of alcohol and stimulants. The substance abuse must be addressed before the BN can be effectively treated.
- 2-50% of pts with BN have some sort of personality disorder, most frequently borderline, antisocial, histrionic or narcissistic. Pts with BN may be impulsive, not only in their eating behaviors, but also in self-mutilation/self-harm behaviors, sexual promiscuity, lying and stealing.

- Anxiety disorders are also common in pts with BN including panic disorder, obsessive-compulsive disorder, generalized anxiety disorder, and post-traumatic stress disorder.

### **3. Medical Complications of BN**

- In general, the medical complications of BN are a direct result of the method of purging. Vomiting and laxative abuse are the most common mechanisms of purging used.

#### **A. Self-induced vomiting:**

- More than 75% of bulimic pts use self-induced vomiting. Most patients vomit immediately or soon after a binge. During the binge, they commonly drink excessive fluids to “float the food” and ease regurgitation.
- Vomiting is induced by placing a finger or a narrow object such as a toothbrush in the oral pharynx. Some patients learn to vomit by pressure or contraction of the abdominal muscles.
- A minority of patients develop reflux following the ingestion of almost any amount of food or fluid. This disorder is difficult to treat and requires training the patient to practice relaxation techniques during eating. There is an association between the rumination syndrome (repetitive regurgitation of small amounts of food from the stomach after which the food is then partially or completely rechewed, reswallowed, or expelled) and BN. In one study, 20% of patients with BN were found to ruminate and in another study, 17% of female ruminators had a history of BN.

#### **B. Medical Complications of Self-Induced Vomiting**

- Gastric acids erode dental enamel (perimolysis), especially the occlusal surfaces of the molars and the posterior surfaces of the maxillary incisors. These changes are irreversible. Enamel erosion occurs in up to 38% of bulimics and appears after approximately 2 years of self-induced vomiting. Pts with severe dental erosion eventually complain of tooth sensitivity secondary to exposed dentin.
- It is unclear whether bulimics have an increased incidence of dental caries. Although they often binge on high sugar content foods, they also appear to take fastidious care of their teeth.
- Cheilosis is a form of stomatitis and appears as pallor and maceration at the angles of the mouth. Linear fissures can form in severe cases and may form scars upon healing.
- Gingivitis may occur from chronic irritation from the acidic gastric contents. Pts complain of painful, erythematous gums. They do not appear to have an increased incidence of periodontitis however.

- Enlarged salivary glands (sialadenosis) is another complication of BN. This occurs in approximately 8% of bulimics. Although the etiology is unknown, pts have painless, bilateral, readily apparent parotid enlargement. Occasionally patients will have submandibular gland enlargement as well. The frequency and severity of the swelling appears to be proportional to the frequency of vomiting. Swelling is usually most apparent 3-6 days after the purging episodes and will often resolve with regression of the purging behavior. The enlargement can be treated with hot compresses or with sucking on tart candies or lemon drops. Occasionally treatment with pilocarpine or parotidectomy has been warranted. 10-20% of patients with parotid enlargement will have elevated serum amylase levels (fractionation reveals a salivary origin). These usually resolve after cessation of vomiting.
- Barrett's esophagus can occur in bulimics although it is unclear whether there is an increased frequency. If a bulimic who induces vomiting complains of severe dyspepsia not well controlled with a proton-pump inhibitor, upper endoscopy should be performed because approximately 10% of cases of Barrett's will progress to adenoCA of the esophagus.
- The most serious complication of self-induced vomiting is esophageal rupture (Boerhaave's syndrome). Fortunately, this is rare because mortality is high (20%). Pts complain of severe chest pain, painful swallowing, tachypnea and tachycardia and a L sided pleural effusion may appear on CXR. Prompt surgery is curative.
- Esophageal and pharyngeal complications: Approximately 50% of bulimics will complain of heartburn, dysphagia or odynophagia from chronic irritation from gastric contents. In general these will resolve after treatment with a proton-pump inhibitor. If the patient complains of blood in the vomitus, this usually indicates a tear in the esophagus which will heal with cessation of vomiting. Persistent severe pain with blood in the vomitus should be evaluated emergently.
- Hand trauma can occur if the patient uses her finger to induce vomiting. Bleeding lacerations of the knuckles or calloused, scarred areas around the knuckles can indicate bulimic behavior. Oral trauma can occur from use of a rigid object such as a toothbrush to induce vomiting.
- Some patients induce vomiting with syrup of ipecac which can cause severe toxicity if abused. Ipecac is composed of 5 alkaloid constituents of which emetine and cephaline dominate. Emetine appears to be the most dangerous because its long half-life (56 hrs) can result in toxic levels if used repeatedly. Most of the toxicity is in skeletal and cardiac muscle. Ipecac cardiomyopathy presents with tachycardia, dyspnea, hypotension and arrhythmias and can proceed to heart failure, ventricular arrhythmias and sudden death. The skeletal muscle complications of ipecac abuse include weakness, pain, tenderness and stiffness.

- Electrolyte disturbances: Chloride, potassium, sodium and magnesium are lost in fluids because of excessive vomiting. Hypokalemia in particular may present as a medical emergency. Symptoms include fatigue, muscle spasms or heart palpitations. More serious complications include paresthesias, tetany, seizures, or cardiac arrhythmias. Metabolic alkalosis is also a direct result of loss of hydrochloric acid in the vomitus.

### **C. Laxative Abuse:**

- Laxative abuse in bulimics is 3.5x more likely than in the general population. Of note is that laxatives actually do little to impair caloric absorption as their primary site of action is in the colon. The primary site of caloric absorption is in the small intestine. Significant weight loss is not achieved through laxative abuse yet it is the second most common mechanism of purging used by bulimics.
- There are 5 major types of laxatives based on mechanism of action:
  2. Bulk laxatives
  3. Osmotics
  4. Surfactants
  5. Emollients
  6. Stimulants
- The laxatives most abused by bulimics are the stimulant laxatives and include those containing phenolphthalein and anthraquinone. They stimulate colonic motility inducing large volumes of watery diarrhea.
- The medical complications of laxative abuse are categorized into the gastrointestinal complications and the systemic complications:

#### **1) Gastrointestinal complications of laxative abuse:**

- Melanosis coli is a dark brown discoloration of the colonic mucosa detected on colonoscopy. There is no known significant pathophysiologic consequence to melanosis coli. It is seen in approximately half of patients taking anthraquinone-based laxatives.
- Functional impairment of colonic motility is common resulting in reflex constipation. If caught early, withdrawal from laxatives results in return of normal colonic function.
- Cathartic colon is much more serious. Here the colon does not peristalt normally because of chronic habituation to stimulants. The colon becomes dilated and atonic and on barium enema, the colon has lost its normal haustral markings. Slowed or absent transit occurs resulting in hard, infrequent stools or occasionally a state of total constipation. Occasionally this state can become so severe and refractory that colectomy is required.

## 2) Systemic complications of laxative abuse:

- Hypovolemia and electrolyte disturbances are the most common complications of laxative abuse. The electrolytes lost in the diarrhea include chloride, calcium, bicarbonate, and potassium. Renal compensatory mechanisms induce a state of secondary hyperaldosteronism. Severe diarrhea results in a hypokalemic, hypochloremic metabolic alkalosis complicated by hypovolemia-induced hyperaldosteronism.
- Bulimics often deny laxative abuse. In suspected cases, you may order toxicologic assays of feces or urine. In addition, surreptitious use of laxatives should be considered in cases of chronic diarrhea. In one study, up to 15% of pts complaining of chronic diarrhea were found to be using laxatives despite denying any laxative ingestion.
- Treatment of laxative abuse can be difficult as patients are hypersensitive to the rebound constipation and fluid retention which occurs during withdrawal from laxatives. Restoration of normal bowel function does not occur immediately and pts experience anxiety over the weight gain. Constipation may be treated with a mild nonstimulant laxative such as Milk of Magnesia or lactulose together with a bulk agent such as psyllium. Do not use diuretics to treat the mild fluid retention which occurs. This will resolve within a few weeks with salt restriction and leg elevation.

## D. Diuretic Abuse:

- Diuretics are used less frequently by bulimics than are laxatives.
- The 2-4 lb weight loss induced by diuretic abuse is ineffective as a weight loss measure as it is followed by reflex fluid retention and the compulsion to continue to use diuretics.
- Often patients are diagnosed with “idiopathic edema.” One author (Bihun) showed through a self-report questionnaire of university women that women diagnosed with “idiopathic edema” had a 70% increased risk of having abnormal eating behaviors compared to women without edema.
- Prescription diuretics can be classified into several groups:
  - Thiazide diuretics
  - Loop diuretics
  - Potassium-sparing diuretics
- OTC diuretics contain one of three possible drugs:
  - Pamabrom
  - Ammonium chloride
  - Caffeine

## **E. Medical complications of diuretic abuse:**

### **1. Hypokalemia:**

- Hypokalemia is the most common and possibly the most dangerous as it can induce cardiac arrhythmias:
- Sinus bradycardia
- Second and third degree heart block
- Atrial flutter
- Ventricular irritability including PVC's, VT, and VF
- Hypokalemia decreases urinary concentrating ability
- Elevated creatinine
- Polyuria
- Polydipsia
- Hypokalemia causes skeletal muscle weakness
- Hypokalemia decreases colonic motility
- Nausea
- Constipation
- Abdominal pain

### **2. Metabolic alkalosis:**

- Metabolic alkalosis results from loss of hydrochloric acid via vomiting and hypovolemia secondary to diuretics, vomiting, and laxative abuse.
- Bulimics develop a pseudo-Bartter's syndrome with a normotensive, hypokalemic, hypochloremic metabolic alkalosis. The hypokalemia cannot be corrected without concomitant correction of the hypovolemic state.
  - There is often an associated Mg depletion from the diuretic use which interferes with repletion of potassium.
- Cessation of use of purging behaviors often results in severe edema as the unopposed aldosterone axis continues to cause fluid retention. This should be managed with salt restriction, leg elevation and patience although occasionally prescription of a potassium-sparing diuretic to negate the effects of aldosterone is warranted.

## Common Electrolyte Changes with Different Purging Modes<sup>1</sup>

Purging Mode	Na	K	Cl	Bicarb
Diuretics	or nl			
Laxatives	or nl			
Vomiting	or nl			

<sup>1</sup>Batal, H et.al. Bulimia: A Primary Care Approach *J of Women's Health*, 1998;7:216.

### **F. Abuse of diet pills**

- Diet pills are probably the most effective of the means of weight control but are used infrequently by bulimics because of their side effects.

### **G. Medical complications of diet pills:**

- Complications of diet pills, which in the past usually contained phenylpropanolamine (PPA), included palpitations, anxiety attacks, headaches, elevated blood pressure and seizures. PPA containing products have been withdrawn from the market by the FDA because of increased risk of CVA.

### **H. Diabetes and Bulimia:**

- Type I diabetics can be bulimic. 30-50% of type I diabetics engage in disordered eating behaviors for weight control. Whether there is an increased prevalence of bulimia among women with type I diabetes or merely an overlap between the two common problems is controversial.
- Type I diabetics may engage in binge-eating with insulin omission, so called “insulin purging.” The resultant glycosuria induces an osmotic diuresis for weight control.
- The nature of Type I diabetes and its management may put women at risk for disordered eating behaviors:
  - Chronic dietary restraint
  - Emphasis on food
  - Family dynamics associated with chronic childhood illness
  - Weight gain associated with tight glycemic control
  - Handy tool for weight loss (insulin omission)

## **I. Medical complications of insulin purging:**

- Higher glycosylated hemoglobin levels
- Increased episodes of hypoglycemia
- Increased hospitalizations for DKA
- Growth retardation
- Pubertal delay in adolescents
- Increased microvascular complications, particularly retinopathy

## **4. Treatment of Bulimia Nervosa**

- Treatment of bulimia nervosa usually requires a team approach. The team should consist of a:
  - Primary care provider to perform ongoing medical monitoring
  - Dietician
  - Therapist (often a family therapist)
  - Psychiatrist
- Communication among team members is key as often the patient may intentionally or unintentionally play one team member against another to divert attention from themselves.
- Occasionally it may appear that the patient makes quick progress but problem behaviors usually resurface soon so on-going monitoring is recommended.
- Role of the primary care provider includes assistance with:
  - Diagnosis
  - Coordination of care among team members
  - Oversight of nutrition to assure adequacy
  - Managing medical complications
- Visits may be weekly, monthly, or daily depending upon the patient. Insurers are reluctant to pay for hospitalization and therefore intensive outpatient therapy may be necessary.
- At each visit, physical examination should include:
  - Orthostatic vital signs
  - Weight
- Laboratory and EKG monitoring as described above

- Patient education is an important part of every visit. Emphasize:
  - Relationship between symptoms/signs and disordered eating behaviors
  - Potential life-threatening complications
  - Hospitalization criteria (see Overview of Eating Disorders)
  - Long-term goals (prevention of osteopenia, preserving fertility)
  
- Establish a goal weight and then use behavior modification to prevent binge/purge cycles and still maintain the goal weight.
  
- Encourage the patient to take responsibility for her own meal plan. Mealtimes should not be a battleground between patient and family.
  
- Dietary needs:
  - Establish a minimum of 2-3 servings of protein per day at first and 30-50 g of fat for a low fat diet.
  - 1200-1500 mg calcium daily (3-4 glasses of milk, calcium-fortified orange juice or chewable supplements)
  
- Behavior modification can take the form of rewards given after each day, week, or month without bingeing or purging. Have the patient plan the rewards with support from the family or friends.
  
- Reasonable exercise prescription can help with weight control and with a feeling of general overall well-being.
  
- Bright light therapy (10,000 lux for 30 minutes in the morning) may prove helpful in some patients with a seasonal pattern to their bulimia.
  
- Medications: Fluoxetine (Prozac) has emerged as an effective medication in BN although the dose which was effective (60 mg) is higher than the dose typically used for depression (20 mg). Medication therapy appears to work better in combination with psychotherapy (see below).
  
- Psychotherapy: Cognitive-behavioral therapy (CBT) appears to show moderate effectiveness in the treatment of BN. The aims of CBT are:
  1. to re-establish a normal eating pattern, in the place of altered eating behavior
  2. to develop coping techniques in order to avoid eating binges and compensatory behaviors
  3. to modify cognitive distortions related to body image

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