

## Emetic exposure and desensitisation procedures in the reduction of nausea and a fear of emesis

Frank M. Dattilio

Harvard Medical School

### *Summary*

*An emetic syrup was titrated according to a reduction schedule in order to recreate graduated levels of nausea in the exposure of a 34-year-old female who developed the fear of nausea and emesis (vomiting) after vomiting on stage during a piano recital. In this particular case, the patient was taught breathing retraining and anxiety reduction techniques such as double swallowing, in addition to some imagery as a desensitisation procedure to avoid reacting to nausea by vomiting. Results in similar case designs suggest that, at times, artificial methods such as the above may be used to create variations of a situation that cannot always be duplicated through pure imaginal exposure or during in vivo exposure, especially when the stimulus involves certain physiological responses such as a gastric regurgitation. A two-year follow-up yielded no indication of relapse and a full return to pre-baseline status.*

*Key words:* fear of nausea, emesis, in vivo desensitisation, and emetic

### 1. Theoretical and research basis

The professional literature is surprisingly quite lean with articles on the treatment of the fear of nausea and emesis (vomiting). In one sense, the fear of nausea and emesis is a rare disorder that is not too often seen by clinicians in mental health centers. Consequently, it was not expected that the professional literature would be abundant with articles of this nature. On the other hand, however, neither was it anticipated that only a <sup>1</sup>© 2003 Sage Publications handful of articles would be available across the span of two decades.

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Reprint requests should be addressed to Frank M. Dattilio.

A small cluster of articles appeared in the professional literature in the 1980's with even fewer in the past decade. In the earlier articles, the majority of which consist of single-case designs, most of the subjects in the cases involved either children or adolescents with the inclusion of only a few adults. Several of these cases included mentally retarded children with a history of self-stimulatory hand-mouthing and ruminative vomiting [1]. Fear of emesis was only reported in adolescent females, particularly those of who were diagnosed with eating disorders. For example, in one particular case report, atypical anorexia in several adolescent females occurred as a result of a fear of vomiting that followed a viral illness as opposed to the specific desire to lose weight or because of an anxiety reaction. Various cognitive and behavioural techniques were also used to reduce fear such as progressive muscle relaxation and imaginal desensitisation.

With regard to studies involving adults, a fear of chronic emesis typically resulted after gastrointestinal surgery in which various abbreviated in vivo desensitisation procedures were used [2]. Other techniques that were used consisted of in vivo exposure to strangers who were vomiting or to the smell of vomit as an olfactory stimulation procedure [3, 4].

Only one case was uncovered that actually involved both the treatment of the fear of nausea and emesis. This case hypothesised that life stress could render individuals more vulnerable to adventitious reinforcements of symptoms. Treatment involved changing the patient's response to symptomatic behaviour as a key component in reducing the fear of nausea and vomiting [5]. Similar desensitisation procedures were also used involving patients' exposure to films of people vomiting in four-minute sequences. This was conducted while having the patient deal with the return of their fear of emesis. In this particular case, a number of individuals who had specific fears of themselves or others vomiting, were treated using an exposure method. Patients were exposed to eight one-hour weekly sessions while three of the patients completed treatment in thirteen sessions. These sessions involved repeated exposure to film sequences of people vomiting which proved to be reasonably successful [6]. Unfortunately, very little has appeared in the professional literature with regard to treatment, particularly involving an artificial means of inducing nausea in vivo. While the use of films or exposure to others vomiting has been successful in the past, this technique seems to have fallen short of allowing patients to desensitise to varying grades of nausea which may, in turn, alter the level of threat of vomiting. Therefore, this case study is unique as it is the first one of its kind to use an emetic in titrated doses to reproduce varying degrees of nausea and to aid the patient in controlling their anxiety over nausea and their urge to vomit in the face of a genuine stimulus.

## **2. Case introduction**

Loni was a 34-year-old, single, Caucasian female who was referred for treatment by her family physician because of a chronic fear of nausea and emesis. Loni, who was an accomplished concert pianist, developed her fear as a result of a traumatic incident that she experienced approximately one and a quarter years prior to treatment. During

a piano recital before a large audience, Loni spontaneously vomited on stage. During the initial intake, she conveyed her traumatic story of a concert that she was scheduled to perform in a major metropolitan city. Loni was excited and eager to perform before this audience and recalled that she experienced very little performance anxiety prior to the incident. She had always performed easily in front of large audiences with almost no anxiety. However, two conditions that contributed to the traumatic incident involved her unknowing pregnancy of several weeks, which caused some uneasiness in her stomach. In addition, her agent took her out for dinner prior to the concert. Loni recalls that they dined at a well-known Indian restaurant in which they were served very spicy foods, which were heavily laced with curry. It was hypothesised that the combination of the spicy foods, some mild anxiety, and possible nausea produced by a first trimester pregnancy rendered Loni vulnerable to gastric upset and eventual nausea with spontaneous vomiting.

Loni reports that she had experienced some slight nausea and belching prior to appearing on stage but decided to drink some water and ignore her symptoms. Upon sitting down at her piano and beginning her performance, she immediately experienced intense nausea and some lightheadedness. Seconds later, she profusely vomited all over the piano in front of the audience. This was terribly traumatic for her at which point Loni quickly exited the stage and vomited several times backstage. Obviously, Loni felt too weak to continue the performance and her recital was cancelled. She was unable to agree to subsequent performances since her fear of experiencing the same scenario was too great.

### 3. Presenting complaints

During the initial interview session, Loni displayed intense emotion and cried when recalling the evening of the incident stating that since that time, she had been extremely anxious over becoming nauseated in general. This was not to mention her inability to perform any type of piano recitals in front of a public audience. Each time Loni would experience nausea, she would vomit which persisted through her miscarriage. The loss of her pregnancy only served to exacerbate her existing anxiety and depression. Subsequent to the miscarriage, however, Loni continued to experience intense anxiety over the slightest nausea and would report vomiting on a frequent basis. This obviously caused her to reduce her caloric intake and consequently she lost considerable weight. In addition, she had become quite selective about the types of food that she would eat, particularly avoiding anything that she perceived to potentially produce nausea or gastric upset.

Loni was first treated by her family physician who initiated her on a regime of medication involving an H<sub>2</sub> antagonist (Pepcid, 40 mg., 1 qd) and a benzodiazepine (Alprazolam, .5 mg., 1 tab, prn). Loni had always been health conscious and was very much against the use of any medications. Consequently, her family physician referred her to a gastroenterologist for her stomach upset as well as a clinical psychologist for the treatment of anxiety. Another aspect of high anxiety for Loni was the fact that she had not performed the piano since her traumatic event and was concerned about the

affect that the incident had on her career. All of this made for increasing anxiety, which was, no doubt, greatly distressing for her.

During the initial interview session, Loni was administered the Structural Clinical Interview Schedule for DSM-IV [7] which yielded a diagnosis of anxiety disorder, not otherwise specified, subsequent to a traumatic incident of embarrassment via emesis. She was further diagnosed with an adjustment disorder with anxiety and no diagnosis on AXIS II. Loni reported no medical condition previous to the incident. She was also administered the Anxiety Sensitivity Index (ASI) [8] and the Beck Depression Inventory (BDI) [9]. The results indicated some mild to moderate depression but a high level of anxiety. An adjunct measure used was the Body Sensations Questionnaire (BSQ) [10]. The idea of using both the ASI and the BSQ was that each contained an item that pertains to nausea aside from them also being sound measures for anxiety. On both of these inventories, Loni categorically marked the highest range under the area of nausea. This was a substitution since there was no particular empirically validated measure for measuring nausea and related threatening events.

#### **4. History**

Loni's life history indicated no major traumas during her upbringing. She reported having a positive relationship with her family and friends and very little indication of ever experiencing any social anxiety. She reported vomiting once or twice during her lifetime due to a stomach virus, but did not recall it to be a traumatic event. Since the vomiting incident on stage, Loni's anxiety had escalated and would generate very easily around any sense or even the mere mention of nausea. She also recalled that she did become anxious when hearing others complain of nausea or seeing others become ill and vomiting since the incident. She also reported no history of mental illness with herself or her family-of-origin.

#### **5. Assessment**

A behavioural analysis was conducted which indicated that Loni's anxiety escalated, producing various intensities of nausea. Her gastroenterologist informed her that intense anxiety typically produces excess stomach acid, which can produce the sensation of burning, nausea, and sometimes vomiting. Such a condition may intensify with spiraling anxiety. In many cases, it is a vicious cycle, which may lead to intense nausea and dyspepsia. In Loni's case, however, even the slightest sense of nausea also brought on the fear of emesis, which, in some cases, was inadvertently self-induced. Consequently, Loni restricted her food intake to liquids and soft foods including Jell-O and certainly nothing that contained any spiciness or content that she perceived to contain acid or anything that would agitate her stomach. This obviously contributed to some weakness on her part and a significant weight loss although she was not deemed to be anorexic. Her body weight was low but still within the normal range for her height.

### The Anxiety Disorder Interview Schedule – IV (ADIS-IV)

The ADIS-IV [11] is a structured interview process designed to assess according to the DSM-IV for anxiety and mood disorders. It also evaluates the presence of co-existing disorders and aids clinicians in rendering a differential diagnosis between panic disorder and other anxiety states. In addition, the ADIS-IV evaluates symptom severity, degree of impairment, and clinical history. The ADIS-IV is widely used by clinicians and in research facilities treating panic.

### The Anxiety Sensitivity Index (ASI)

This is a self-report questionnaire in which each of the 16 items measure fear of anxiety related symptoms as rated by the patient. Each item is rated on a five-point scale ranging from 0 (*very little*) to 4 (*very much*). The ASI is one of the most popular and widely researched measures for panic disorder and related conditions.

The ASI can be administered in 3 to 5 minutes. It is scored by summing all 16 possible score ranges from 0 to 64 with higher scores reflecting elevated levels of anxiety sensitivity. The ASI has good to excellent internal consistency with satisfactory test/retest reliability. The ASI has been demonstrated to have a satisfactory degree of criterion validity and construct validity [8].

### Body Sensations Questionnaire (BSQ)

The BSQ is an 18-item instrument designed to measure body sensations associated with panic and agoraphobia [10]. The specific items were generated from interviews from clients and therapists in an agoraphobia treatment program. The BSQ contains items that clients report to be disturbing that are associated with anxiety, one of which being nausea. The BSQ has very good internal consistency with an alpha of .87. It has good stability with one-month test/retest correlation of .67 and good concurrent validity correlating with other measures of psychopathology. The BSQ is scored by summing the individual item ratings and by dividing the number of items rated. The mean score is 3.05 with a standard deviation of .86.

### Beck Depression Inventory–II (BDI–II)

The BDI–II is a 21-item self-report instrument designed to assess the affective cognitive physiological and motivational features of depression in terms of both presence and severity [9]. Each item is rated on a four point Likert-type scale (0,1,2, or 3), which yields a summary score that ranges from 0 to 63. The higher the score, the more severe the depression. The BDI-II has demonstrated high internal consistency with alpha coefficients ranging from .91 to .93 [9, 12]. Also, adequate content validity and factorial validity has been recorded.

## 6. Case conceptualisation

This was a very interesting but arduous case in the sense that not only did Loni maintain a concern for her body reaction, which she perceived to be uncontrollable; she was also left with the daunting task of resuming her piano performance. This thought only increased her anxiety especially with the anticipation of something happening that would cause embarrassment.

As a result, it was decided in treatment that we would initially work on the aspect of helping Loni to control her anxiety and urge to vomit in the wake of any experience of nausea. In this respect, nausea actually became the initial target of desensitisation. Because this presented as a somewhat dichotomous stimulus (vomiting or not vomiting) it was thought that a mechanism for developing a graduated intensity of nausea would be helpful in developing a SUD's Scale (subjective units of disturbance) for desensitisation. It was decided to use progressive muscle relaxation, breathing retraining, and selected mental imagery in order to reduce anxiety and to also reduce the level of acid in Loni's stomach in combination with the H<sub>2</sub> antagonist, Pepcid. Loni was also asked to construct a serene setting in her mind that represented peacefulness and a sense of calm that she could refer to during her relaxation exercises. A modified version of the progressive muscle relaxation exercise was used along with controlled breathing. A second step was to introduce an emetic substance known as Syrup of Ipecac in order to produce the very lowest and mildest level of nausea. Syrup of Ipecac is an emetic that causes nausea and stimulates the central chemoreceptor trigger zone through the central nervous system to induce vomiting. Vomiting usually occurs approximately 10 to 15 minutes following the administration of the syrup in full dose, which is orally ingested. A prelude to the vomiting involves some nausea. Emetics are typically utilised in the emergency treatment of drug overdose or in certain cases where poisoning has occurred. The dose administered orally is usually 30 ml for adults. It was decided, however, that a titrated schedule beginning with 1 ml increments graduating to 10 ml and then 15 ml up to a period short of 30 ml might induce gradual levels of nausea without vomiting. The side effects of Syrup of Ipecac are usually involved with small children and include lethargy. The only risks of using Syrup of Ipecac come from chronic use if absorbed which may cause cardiac toxicity and/or electrolyte and fluid abnormalities as well as myopathy. This is rare, however, and only occurs as a result of chronic use in higher doses. Except for aspiration, serious complications are rare. Isolated cases of gastric and esophageal tears and perforations or stroke have been reported. Syrup of Ipecac is contraindicated in patients with recent gastrointestinal surgery, CNS depression, seizures, and ingestion of corrosives, and rapid acting CNS poisons such as Camphor, Cyanide, Tricyclic antidepressants, etc. Loni was informed of the potential side effects, albeit rare, and signed a consent form agreeing to a short-term use for exposure purposes. She was also referred to her internist for an ECG as well as a neurological examination in order to rule out any previous undetected seizure disorder. It was the treating clinician's hope, however, that very little of the Syrup of Ipecac would need to be administered. The lowest of the incremental doses of Syrup of Ipecac would hopefully serve as enough of a stimulus to artificially induce nausea without ascending to the higher doses.

The idea was to expose Loni to various levels of nausea, first on a relatively empty stomach and subsequently to repeat the same regime with selected food groups so that she would be able to acclimate to having a partially and then full stomach. This dimension was added so that the fear of vomiting would become more threatening to her. The idea of explaining to Loni the use of Syrup of Ipecac was to create an actual situation in which nausea would eventually be reduced thus reducing the fear of vomiting. The use of anxiety reduction techniques and gastric control was used to avoid vomiting. Loni was taught to use a combination of deep breathing and progressive muscle relaxation along with imagery of a serene setting. For her, such an image consisted of a “deep, soft meadow”. She was also taught to restructure her schemas (beliefs) that nausea would always lead to vomiting in order to break the steadfast connection in her mind. It was the hope that this would be the best way to expose Loni to a situation where she could develop confidence over her own capabilities and, in essence, learn to trust her body’s physical reaction.

### **7. Course of treatment and assessment of progress**

Various courses of exposure treatment were monitored by Loni’s scores on the Anxiety Sensitivity Index (ASI), Body Sensations Questionnaire (BSQ), and the Beck Depression Inventory (BDI). A 3-week baseline was constructed using the aforementioned measures in order to determine Loni’s initial level of anxiety and depression (see Figure 1).

Loni was then taught progressive muscle relaxation and the use of visual imagery in order to prepare her for exposure. A hierarchy was constructed for the imaginal exposure. Loni was asked to think of being on stage and performing which was a situation that was extremely anxiety producing for her. Loni was then introduced to varying grades of nausea via titrated levels of Syrup of Ipecac. These titrations were diluted by adding water (since Syrup of Ipecac is water soluble) and then increasing the amounts of pure syrup to each milliliter until the desired level was reached. The initial level was 3 ml and titrated upward. As much water as possible was used in order to dilute the Syrup of Ipecac and to reduce the risk of agitation. After a while, most increments didn’t matter since, as long as Loni thought that she was receiving more Syrup of Ipecac, she would develop nausea. Consequently, the majority of the solution actually consisted of water.

During exposure trials, if Loni felt as though she was going to vomit, she was first instructed to take a deep breath and release it slowly. She was also instructed to swallow two times in an attempt to alter the gag reflex. Obviously, a canister was always available in case she were to fail. Surprisingly, Loni never once vomited during the process of treatment.

Progress was measured using the ASI and the BSQ to measure anxiety reduction and reduction of the fear of nausea. One specific item on both the ASI and the BSQ involved nausea numbers. These levels of response were then monitored separately for fluctuation.

Once an exposure schedule was developed, Loni was taught to utilise her anxiety reduction techniques as well as cognitive restructuring for avoiding her focus of becoming ill and vomiting. She was instructed to focus specifically on remaining relaxed and calm and cognitively avoid an emphasis on vomiting or images that would produce anxiety about vomiting. For example, if the image of vomiting entered her mind, she was to shift her focus to her image of lying in a meadow in a relaxed state and combine this with controlled breathing. The idea of controlling her bodily symptoms through breathing retraining and trusting her body functions was paramount to her success. Once relaxed, she was then instructed to allow any anxiety producing images to enter her mind while she remained calm and relaxed.

Once Loni was exposed to varying levels of Ipecac, she was successfully able to maintain herself without vomiting after consuming a half to a full portion of Jell-O and saltine crackers. She developed confidence and anxiety reduction skills centering around her nausea which inadvertently affected her ability to refrain from vomiting.

A second segment of treatment exposed her to a new hierarchy of playing the piano in front of a group of people. This progressed upward towards larger groups and then more formal settings and community events. Some of her performances even occurred during periods in which she was under the influence of Syrup of Ipecac on low levels so that some threat of nausea and vomiting was produced with the idea that food in her stomach rendered her vulnerable. This only occurred, however, after she developed confidence that nausea and vomiting were no longer an area of difficulty for her. She was gradually exposed upward to resuming her performance and happily, to this day, is continuing to perform on stage without difficulty.

### **8. Complicating factors**

The most complicated factor involved with this case was the small risk of using Syrup of Ipecac in order to develop gradations of nausea. There was no way to conceive how this would be manufactured other than through the use of an emetic such as the Syrup of Ipecac. It was initially thought to use a variety of spicy foods to accomplish the same task, however, this would not necessarily provide a controlled gradation of nausea and guarantee that nausea would occur. It was actually more likely to cause immediate vomiting which was certainly not the desired goal. The second complicating factor, of course, was to teach Loni to maintain control of her bodily functions in the face of an actual physiological antagonist that would cause vomiting. This was difficult yet achieved, which was helpful to Loni in learning how to control her bodily functions. The risk of another vomiting episode was always present, however. In the event that this may have occurred, it certainly would have caused a major regression.

### **9. Follow-up**

Follow-up by telephone was made in six-month intervals after the discontinuation of treatment. Loni was also mailed the aforementioned measures to complete. Follow-up over the course of 2 years indicated that Loni experienced no relapse in symptoms. In addition, her scores on the BDI, ASI, and the BSQ reflect a high level



of success. Booster sessions were made available to Loni throughout the follow-up period, although she never felt the need to utilise them.

### **10. Treatment implications in the case**

It is always difficult in cases such as this one to indicate exactly what contributes to success. Obviously, the reduction of anxiety had a tremendous impact on Loni's success. One has to wonder how much anxiety played a substantial role in the original incident as opposed to the first trimester pregnancy and the exposure to spicy food. It is clear that the use of the titrated levels of the emetic were extremely helpful in reproducing a hierarchy that was effective in ameliorating this problem. Interestingly, it was only later that it was determined that the varying levels of Ipecac actually ceased producing nausea since, as an emetic, it tends to be dichotomous; that is, it either produces vomiting or it doesn't. In essence, this suggests that Loni was actually producing the varying levels of nausea herself unknowingly.

The standard procedures of progressive muscle relaxation and breathing retraining also helped tremendously with Loni's anxiety reduction. The H<sub>2</sub> antagonist was eventually titrated during the course of exposure therapy so that this was also not a primary factor affecting her progress.

Overall, in layman's terms, Loni regained her confidence to perform without incident. Certainly part of the treatment also involved dealing with the embarrassment that she was caused as a result of the initial vomiting incident on stage. One of the goals of treatment was to have her return and speak with some of the people who were backstage during that initial performance, and also those who were part of the audience the evening that she vomited. Loni surprisingly learned that more people were actually sympathetic toward her than felt ridicule or disgust. This also served to bolster Loni's confidence in forging ahead.

### **11. Recommendations to clinicians and students**

If this case serves as any message at all to students and clinicians, it should be that sometimes complicated treatment designs need to be implemented in order to achieve success with complicated cases. Loni's case was certainly a difficult one in which most people could truly feel compassion for her circumstance. At the same time, most clinicians would be at a loss as to where to even begin with a case presenting with such a challenge. The use of creative techniques for exposure and anxiety reduction were clearly necessary in order to make a full recovery. It is important, however, that clinicians and students always maintain some type of medical supervision when using such a combination of techniques. In this particular case, Loni had also been requested to obtain a full physical examination, including an ECG and neurological studies, in order to rule out any potential difficulties that might occur during the course of exposure therapy (i.e., seizure activity, cardiac symptoms, etc.). Also, the proposed exposure designed was discussed with an independent source, which included a psychiatrist and a gastroenterologist who is also board certified in internal medicine. In addition, Loni

was provided with the opportunity to discontinue the exposure treatment at any time she desired. In essence, this provided her with some reassurance that she was able to always maintain control during the course of treatment.

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Author's address:

Frank M. Dattilio, Ph.D., ABPP  
Harvard Medical School  
Suite 211-D, 1251 S. Cedar Crest Blvd.  
Allentown, PA 18103  
e-mail: datt02cip@cs.com.

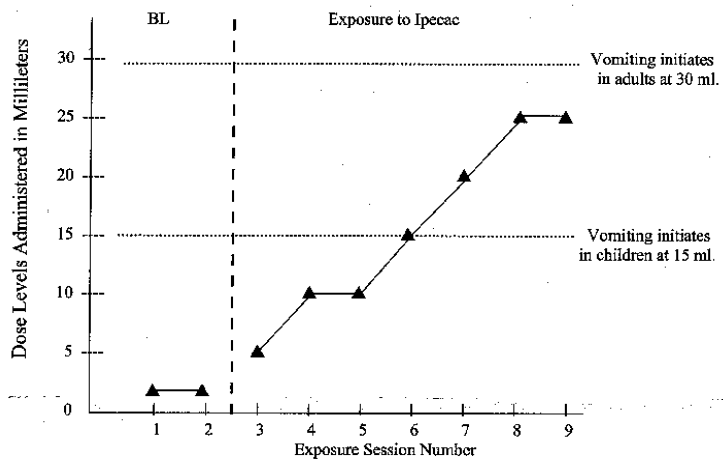


Figure 1: Exposure Sessions to Syrup of Ipecac

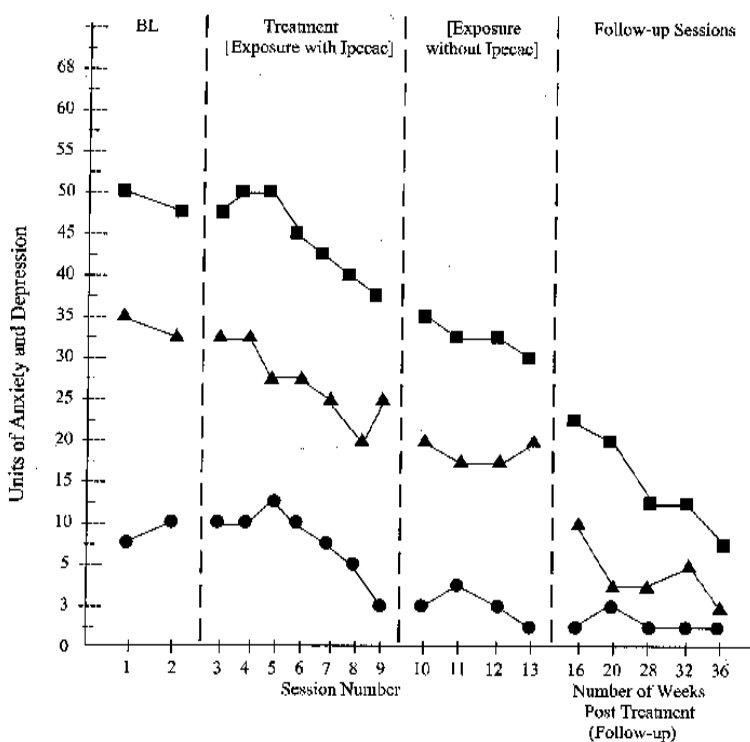


Figure 2: ASI, BSQ and BDI-II Scores

- - ASI Scores
- - BSQ Scores
- ▲ - BDI-II Scores

