

AN ABSTRACT OF THE DISSERTATION OF

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Title: The Influence of Selected Factors on Dentists' Delivery of a Set of 5A-  
Like Intervention Strategies for Eating Disorders in Oregon.

Abstract approved: \_\_\_\_\_  
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Each year an estimated one million young women in the United States develop an eating disorder. Without early recognition of symptoms and early intervention/treatment, these eating disorders can lead to a host of chronic and debilitating illnesses.

Tooth erosion is one of the first signs of an eating disorder, providing dentists with a unique role in detecting potential problems. Little is known about what dentists do with patients suspected of an eating disorder and importantly, no guidelines exist to assist the dentists.

The purpose of this study was to: 1) identify potential strategies that experts believe are important for dentists to utilize when intervening with patients suspected of an eating disorder, 2) determine the nature and extent of current intervention strategies for eating disorders by dentists, 3) identify factors that influence dentist delivery of intervention strategies for eating disorders.

The study consisted of two parts; Part I involved a sample of 30 experts and utilized a two round Delphi survey to elicit information about potential strategies dentists could use in eating disorder interventions. In Part II of the study, another survey instrument was developed to assess whether or not dentists were utilizing any of the expert recommended strategies identified in Part I. The survey was mailed to a stratified, proportional, random sample of 763 dentists from four regions in the state of Oregon.

Results of Part I indicated that experts agreed on nine potential intervention strategies that dentists should be doing with patients suspected of an eating disorder. Results of Part II indicated that the majority of dentists were not using any of the intervention strategies on a regular basis. A five block hierarchical model assessed potential associations between independent variables and frequency of dentist intervention strategies in clinical practice. Although all blocks were statistically significant, perceived barriers was the predictor block that explained the most variance in the dependent variable.

By defining the roles and responsibilities of dentists in intervening with eating disordered patients, dentists would have an essential framework of options to assist patients in seeking help in the earliest stages of an eating disorder.

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The Influence of Selected Factors on Dentists'  
Delivery of a Set of 5A-Like Intervention Strategies  
for Eating Disorders in Oregon

by  
Karen M. Elliott

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Chair of the Department of Public Health

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Dean of the Graduate School

I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

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Karen M. Elliott, Author

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## PREFACE

This dissertation was constructed in a format to combine the five traditional chapters with three completed articles. The chapters are: Introduction, Literature Review, Methodology, Results, Discussion, Conclusions and Recommendations. The Results Chapter is comprised of three articles. Article one describes the development of a set intervention strategies through a solicitation of experts in the fields of eating disorders and dental interventions. Article two discusses the nature and extent of dentist utilization of interventions strategies for eating disorders in Oregon. Article three discusses the influence of dentists' factors on frequency of the delivery of intervention strategies for eating disorders in Oregon.

# **The Influence of Selected Factors on Dentists' Delivery of a Set of 5A-Like Intervention Strategies for Eating Disorders in Oregon**

## **CHAPTER 1**

### **INTRODUCTION**

An estimated ten million women in the United States suffer from an eating disorder such as anorexia or bulimia (National Eating Disorder Association, 2005). Young women, in particular, appear to be at high risk for development of these diseases, with approximately one million new cases each year (White & White, 2000). Ninety-five percent of these cases are among women ages 12-25, with increasing incidence in the 8-11 year old population (Faine, 2003; White & White, 2000; Studen-Pavolvich & Elliott, 2001; Farley, 2002; Renfrew Center Foundation, 2003).

*Anorexia nervosa* is defined as a refusal to maintain normal body weight and a fear of gaining weight. To establish a diagnosis of anorexia, an individual must also experience a dissatisfaction and disturbance in body shape and weight and *amenorrhea* or loss of menstruation (American Psychiatric Association, 1994). It is estimated that up to 5% of females are diagnosed with anorexia (Makino, Tsuboi & Dennerstein, 2004). Those who suffer from anorexia may also engage in bulimic behaviors. This combination of eating disorders occurs in approximately 25 to 50% of those diagnosed with anorexia and is referred to as bulimiarexia (Clark, 1985; Robb & Smith, 1996).

*Bulimia nervosa* is characterized as frequent episodes of uncontrolled binge eating followed by compensatory behaviors to prevent weight gain such as vomiting, laxative and diuretic abuse (American Psychiatric Association, 1994). It is estimated that up to 7% females suffer from bulimia (Makino, Tsuboi & Dennerstein, 2004). The Diagnostic and Statistical Manual of Mental Disorders DSM-IV (1994) specifies that the bingeing and compensatory behavior must occur at least twice a week for three months in order to establish a diagnosis of bulimia. Like anorexics, those with bulimia also experience dissatisfaction with their body shape and weight (American Psychiatric Association, 1994).

Several mental disorders can be associated with both anorexia and bulimia. An estimated 40% of anorexics and bulimics suffer from anxiety disorders such as obsessive compulsive disorder (Eating Disorders Annual Report, 2001). In addition, approximately 50% of those diagnosed with eating disorders also meet the criteria for clinical depression (Renfrew Center Foundation, 2003). Without treatment, especially early treatment, conditions associated with anorexia and bulimia can become chronic and debilitating (Bouqout & Seime, 1997).

Approximately 480,000 individuals die each year from eating disorder related complications (Renfrew Center Foundation, 2003). Anorexia has the highest death rate of any mental health condition, estimated to be as high as 22% among those who are untreated or who fail to receive treatment until the later stages of disease (White & White, 2000; Roberts & Tylenda, 1989; Simon

& Stern, 2002). Although a significant numbers of cases die of progressive disease pathology such as cardiovascular complications, it is estimated that suicide accounts for as many as half of the deaths in anorexia (White & White, 2000; Simon & Stern, 2002; Renfrew Center Foundation, 2003).

The etiology of eating disorders is complex and involves both primary and secondary risk factors. There are numerous theories about why individuals, particularly young women, develop patterns of disordered eating. Primary risk factors include being young, female and living in Western society (Fairburn & Harrison, 2003). In addition to these primary risk factors, there are also many secondary risk factors associated with eating disorders (Fairburn & Harrison, 2003; Studen-Pavlovich & Elliott, 2001; Robb & Smith, 1996; Brown & Bonifazi, 1993; Brownell & Fairburn, 1995). These include negative family influences, parental history of alcoholism, sexual and physical abuse and personality characteristics, such as perfectionism and low self esteem (Faine, 2003; Simon & Stern, 2002; Costin, 1999). After the onset of an eating disorder due to these various and complex risk factors, individuals suffer from a wide variety of physical symptoms.

The physical symptoms of anorexia include loss of menstruation, osteoporosis, heart arrhythmias, and tooth erosion due to dietary issues (Studen-Pavlovich & Elliott, 2001; Faine, 2003; Gurenlian, 2002). For bulimia, the physical symptoms include electrolyte imbalances, dehydration, cardiovascular complications, esophageal tears, tooth erosion and gastric

rupture due to binging and purging (Studen-Pavlovich & Elliott, 2001; Faine, 2003).

Although many of these physical symptoms present as characteristic signs of anorexia or bulimia, they usually occur when the eating disorder has progressed to more serious stages (White & White, 2000). However, tooth erosion is one symptom that occurs in the early stages of the eating disorder, as early as 6 months after the onset of the behaviors and can often be the first visible sign of either anorexia or bulimia (Faine, 2003; Altshuler, Dechow, Waller & Hardy, 1990; Rytomaa, Jarvinene, Kanerva & Heinonen, 1998).

Oral manifestations such as tooth erosion are a result of starvation associated with anorexia and excessive vomiting associated with bulimia. Chronic regurgitation causes the hydrochloric acid from the stomach to break down the enamel and the dentin of the teeth which results in perimolysis or erosion and demineralization of the tooth enamel (Gurenlian, 2002; Faine, 2003). Tooth erosion can also be attributed to excessive consumption of acidic foods and beverages such as citrus fruits and diet soda, which are staples in the diet of individuals with an eating disorder (Phillip, Willershausen-Zonnchen, Hamm & Pirke, 1991; Faine, 2003; American Dietetic Association, 2003). Other oral symptoms include dental caries, enlarged parotid gland, dentin hypersensitivity, dry mouth, periodontal disease and soft tissue lesions as a result of excessive vomiting and gastric acids in the mouth (Rytomaa, Jarvinene, Kanerva & Heinonen, 1998; Hazelton & Faine, 1996; De Moor, 2004; Faine, 2003).



Since dental erosion can be the first visible sign of an eating disorder; dentists have a unique “window of opportunity” to be the clinician to detect eating disorders (De Moor, 2004; Faine, 2003; Schmidt & Treasure, 1997). This is especially true since a large majority of adolescents regularly visit the dentist. Results of the National Youth Tobacco Survey indicated that 71% of youth ages 11-18 visited the dentist within the past twelve months (Shelley et al, 2005).

Other clinicians, especially primary care physicians, often are not aware of patients with eating disorders because of a lack of visible symptoms in the early stages (Maradiegue, Cecelic, Bozzelli & Frances, 1996; Bursten, Gabel, Brose & Monk, 1996; Karwautz, Wober-Bingol, Wober & Friedrich, 1997; Sayag & Latzer, 2002). Typically, the majority of bulimics maintain normal lab results and a normal body weight in the early stages of the disease (Sayag & Latzer, 2002; Bursten, Gabel, Brose & Monk, 1996). Approximately 50% of eating disorder cases go undetected in the clinical setting (Marks, Beumont, & Birmingham, 2003; Karwautz, Wober-Bingol, Wober & Friedrich, 1997). Since physicians are not detecting eating disorders, this emphasizes the fact that dentists are in an ideal position to detect the conditions in the early stages. However, little is known about dental interventions and eating disorders.

One area where there has been considerable research in dental interventions and health behaviors is in the area of tobacco. Like eating disorders, tobacco can result in significant oral damage. The symptoms for tobacco use include an increased risk of oral cancer and periodontitis or

inflammation of the gums. Tobacco use, just like eating disorders, is a sensitive issue that requires an intervention with the patient (Tomar, 2001). To provide guidance for clinicians including dentists, the United States Public Health Service has specific recommendations for brief and effective tobacco interventions known as the 5 A's (Yip, Hay, Ostroff, Stewart & Cruz, 2000; Fiore, 2000). The 5 A's, which consist of **A**sk, **A**dvice, **A**ssess, **A**ssist and **A**rrange, provide dentists with brief and standard strategies regarding tobacco interventions with patients (Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997; Warnakulasuriya, 2002; Barker & Williams, 1999; Shelley et al, 2005; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1999; Fiore, 2000; Tomar, 2001; Albert, Ward, Ahluwalia, & Sadowsky, 2002; Yip, Hay, Ostroff, Stewart & Cruz, 2000).

Numerous studies have demonstrated the importance of clinicians' efforts in *asking* patients about their smoking behaviors, *advising* them about the harmful effects of smoking, *assessing* the patient's willingness to quit, *assisting* patients in becoming more aware of potential resources to stop smoking and *arranging* follow-up contacts to prevent relapse (Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997; Warnakulasuriya, 2002; Barker & Williams, 1999; Shelley et al, 2005; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1997; Fiore, 2000; Tomar, 2001; Albert, Ward, Ahluwalia, & Sadowsky, 2002; Yip, Hay, Ostroff, Stewart & Cruz, 2000).

The 5A's have been shown to be effective within the clinical setting by increasing quit rates among patients that smoke (Fiore, 2000; Clover, Hazell,

Stanbridge, & Sanson-Fisher, 1997; Warnakulasuriya, 2002, Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997). Since these guidelines have been beneficial for tobacco interventions, similar guidelines could be created to assist dentists with other oral health issues that involve behavior change. Anorexia and bulimia, in particular, are health issues that require early detection and intervention in order to significantly increase the chances for a favorable outcome (Brown & Bonifazi, 1993; Marks, Beumont, & Birmingham, 2003). Guidelines for eating disorder interventions in the dental office could provide significant results similar to the success of the 5A's with tobacco.

Despite the fact that dentists can be the first clinicians to recognize eating disorders, little is known about the actions, if any, that dentists take when they suspect an eating disorder (Silber & Wynne, 1999). In addition, little is known about potential factors that may influence dental care for patients suspected of having eating disorders (Silber & Wynne, 1999; DiGiacchino, Keenan & Sargent; 2000).

The purpose of this study was to: 1) identify potential strategies that experts believe are important for dentists to utilize when intervening with patients suspected of an eating disorder 2) determine the nature and extent of current intervention strategies for eating disorders by dentists 3) identify factors that influence how often the dentists utilize intervention strategies for eating disorders. By exploring current situations for dental care and eating disorders, potential areas for improvement can be identified to increase the

likelihood of early diagnosis (Burke, Ismail, & Hartley, 1996; Woodmansey, 2000; Brown & Bonifazi, 1993; Marks, Beumont, & Birmingham, 2003).

### **Research Questions**

1. What are potential strategies that experts agree would form a set of intervention strategies for dentists to utilize when intervening with patients suspected of an eating disorder?
2. What is the nature and extent of current intervention strategies for eating disorders by dentists?
3. What factors (demographics, professional development, education, beliefs or perceived barriers) influence how often the dentists utilize intervention strategies for eating disorders?

### **Hypothesis**

1. There will be an association between selected dentist's factors (demographics, education, professional development, beliefs, and perceived barriers) and how often the dentists utilize intervention strategies for eating disorders.

### **Limitations**

The limitations of this study are:

1. The study population for the dentists will be limited to a representative sample of Oregon dentists and as such the results cannot be generalized to dentists outside of Oregon.
2. The results of the survey are based on self-report and depend on the participants' accuracy and honesty in filling out the survey.

3. Response is limited to the voluntary action of the participants in filling out the survey and mailing it back with a provided self-addressed stamped envelope.
4. The results are based on a response rate of 50%.

## CHAPTER 2

### LITERATURE REVIEW

#### **Eating Disorders**

One in five females currently struggle from disordered eating and one million women will develop an eating disorder each year in the United States (Renfrew Center Foundation, 2003; National Eating Disorder Association, 2005). Young women have a significantly high risk for eating disorders with ninety-five percent of all cases occurring among women ages 12-25, and increasing incidence in the 8-11 year old population (Faine, 2003; White & White, 2000; Studen-Pavolvich & Elliott, 2001; Farley, 2002; Renfrew Center Foundation, 2003).

The Fourth Edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV) (1994) recognizes anorexia, bulimia, and binge eating disorder as the three main categories of eating disorders. The DSM-IV (1994) also includes another category that is entitled “Eating Disorders Not Otherwise Specified”. Although there are several different types of disordered eating, this study will specifically focus on anorexia and bulimia. The rationale is that anorexia and bulimia are the two types of eating disorders that are associated with a high incidence of oral manifestations, which is the focus of this study (Gurenlian, 2002).

## **Anorexia**

Approximately 5-10 percent of adolescent girls in the United States suffer from anorexia (Farley, 2002; White & White, 2000). Anorexia has the highest death rate of any mental health condition, estimated to be as high as 22% if left untreated. Suicide accounts for as many as half of the deaths in anorexia (White & White, 2000; Roberts & Tylanda, 1989; Simon & Stern, 2002).

Anorexia nervosa, a Latin term meaning “nervous loss of appetite” has been identified as a medical condition in society since the 1800’s (Brown & Bonifazi, 1993; Gurenlian, 2002; Carni, 1980). Defined as a refusal to maintain a normal body weight with an intense fear of gaining weight, anorexia nervosa poses a serious health risk for young girls (Brown & Bonifazi, 1993; Gurenlian, 2002). For a complete description of the major characteristics used by clinicians to diagnose anorexia, see The Fourth Edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV) (1994) summary provided in Table 2.1.

In addition to the DSM-IV criteria for anorexia, researchers have also documented various behaviors and signs that are commonly associated with this eating disorder. These behaviors can include compulsive exercising, refusal to eat in front of others, cooking for others but not eating, and ritualistic patterns such as eating certain foods at certain times of the day and avoiding foods that contain fat (White & White, 2000; Powers & Santana, 2002; Simon & Stern, 2002; Altschuler, 1986; Costin, 1999; Faine, 2003; Goldstein, 1999; Silber & Wynne, 1999).

**Table 2.1 DSM-IV Criteria for Anorexia Nervosa**

- A. Refusal to maintain body weight at or above a minimally normal weight for age and height (eg, weight loss leading to maintenance of body weight less than 85% of that expected or failure to make expected weight gain during period of growth, leading to body weight less than 85% of that expected).
- B. Intense fear of gaining weight or becoming fat, even though underweight.
- C. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.
- D. In postmenarchal females, amenorrhea ie, the absence of at least three consecutive cycles. (A woman is considered to have amenorrhea if her periods occur only following hormone, eg, estrogen administration.)
- **Restricting Type:** During the current episode of anorexia nervosa, the person has not regularly engaged in binge-eating or purging behavior (ie, self-induced vomiting or the misuse of laxatives, diuretics, or enemas).
  - **Binge-Eating/Purging Type:** During the current episode of anorexia nervosa, the person has regularly engaged in binge-eating or purging behavior (ie, self-induced vomiting or the misuse of laxatives, diuretics, or enemas).

As the eating disorder progresses, the individual becomes withdrawn and socially isolated as eating becomes a private activity (Fairburn & Harrison, 2003; Altschuler, 1986; Powers & Santana, 2002). Simon and Stern (2002) state that as many as one third of anorexia patients have avoidant type personalities in which they stay away from social situations and alienate themselves.



Anorexics have also been described as displaying a determined pursuit for weight loss and view their low weight as an accomplishment and impressive achievement (Fairburn & Harrison, 2003; DSM-IV, 1994). Many anorexics view weight gain as a lack of self-control and their self-esteem is dependent on their weight (Studen-Pavlovich & Elliott, 2001; Costin, 1999; DSM-IV, 1994).

Individuals with anorexia may also engage in bulimic behaviors such as purging, laxative and diuretic abuse. An estimated 25-50% of individuals with anorexia engage in bulimic behaviors. In these cases the term “bulimiarexia” is used to describe this combination of the eating disorders (Carni, 1980; Clark, 1985; Robb & Smith, 1996; Studen-Pavlovich & Elliott, 2001; Gurenlian, 2002; White & White, 2000).

### **Bulimia**

Approximately 20% of American college women suffer from bulimia (Faine, 2003; White & White, 2000). One in every 300 cases of bulimia ends in death, a clear indicator of the potentially devastating impact of this disorder (Bouqout & Seime, 1997).

Bulimia nervosa, a term derived from the Greek term meaning “ox hunger” was first recognized as a medical condition in the 1970’s (Bouqout & Seime, 1997; Carni, 1980; Gurenlian, 2002; Studen-Pavlovich & Elliott, 2001). Bulimia nervosa is defined as excessive binge eating accompanied by compensatory behaviors such as self-induced vomiting, abuse of laxatives or diuretics and excessive exercise to prevent weight gain (Bouqout & Seime, 1997; Carni, 1980; Gurenlian, 2002; Studen-Pavlovich & Elliott, 2001;

Woodmansey, 2000). The Diagnostic and Statistical Manual for Mental Disorders, Fourth Edition (DSM-IV) (1994) lists five major characteristics for clinicians to identify and diagnose individuals with bulimia nervosa (See Table 2.2).

**Table 2.2 DSM-IV Criteria for Bulimia Nervosa**

- A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following: (1) Eating, in a discrete period of time (eg, within any 2-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. (2) A sense of lack of control over eating during the episode (eg, a feeling that one cannot stop eating or control what or how much one is eating).
  - B. 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.
  - C. The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for 3 months.
  - D. Self-evaluation is unduly influenced by body shape and weight.
  - E. The disturbance does not occur exclusively during episodes of anorexia nervosa.
- **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 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.

Additional behaviors and signs that are commonly associated with bulimia include regularly going to the bathroom right after meals, suddenly eating large amounts of food or buying large quantities of food that disappear quickly, and compulsive exercising (Costin, 1999; Faine, 2003; Simon & Stern, 2002;

Goldstein, 1999). Some individuals also develop small cuts and calluses on the tops of fingers from thrusting them past the front teeth to induce vomiting (Simon & Stern, 2002).

Individuals with bulimia have been described as bingeing in secret, consuming anywhere from 3,500 to 20,000 calories in one binge. The foods selected during a binge may often include high calorie sweets such as ice cream, candy and cake (Bianco, 1991; Altschuler et al, 1986; Spigset, 1991; DSM-IV, 1994). The binge may last from 1-2 hours and vomiting can occur 2-15 times a day (Altshuler, 1986; Zachariasen, 1995). In extreme cases, vomiting has been reported to occur as often as 40 times per day (Gross, Brough, & Randolph, 1986; Woodmansey, 2000; Bouqout & Sieme, 1997). Vomiting initiated after the binge is often a result of extreme guilt, feelings of loss of control and depression that may be associated with consuming large quantities of food (Kaye, Klump, Frank & Strober, 2000; Carni, 1980; Bouqout & Seime, 1997; Gross, Brough, & Randolph, 1986).

Bulimics may also engage in other compensatory behaviors such as abusing diuretics and laxatives to prevent weight gain (Costin, 1999; Goldstein, 1999; Faine, 2003). Ruff, Koch & Perkins (1992) reported that bulimic individuals may use up to 50 times the recommended dosage of laxatives. Although it occurs less frequently, diuretic abuse may consist of ingesting large amounts of water pills (Costin, 1999).

Many bulimics also abuse syrup of ipecac (Altshuler, 1986; Costin, 1999; Simon & Stern, 2002; White & White, 2000). Syrup of ipecac is an over-the-

counter product normally used as an antidote to poison, that induces vomiting. Bulimics may abuse this product to initiate vomiting after a binge (Altshuler, 1986; Costin, 1999; Simon & Stern, 2002; White & White, 2000).

While the binge and purge phenomenon is what may commonly be the profile for bulimia, bulimics may also partake in other self-destructive behaviors such as self-injury and substance abuse (Fairburn & Harrison, 2003). Approximately 30-70% of those with bulimia are reported to abuse drugs or alcohol. These percentages are higher than the rates found in the general population (Simon & Stern, 2002; Pritts & Susman, 2003; Kaye, Frank, & Strober, 2000; Fairburn & Harrison, 2003).

The behaviors and signs of both bulimia and anorexia can vary by individual; however the frequency of the behaviors as they are defined by the DSM-IV is the critical aspect for diagnosis (Costin, 1999; Goldstein, 1999; DSM-IV, 1994). When considering diagnosis, it is also important to understand the risk factors associated with both eating disorders.

### **Primary Risk Factors**

There are several primary risk factors connected with both anorexia and bulimia. Past studies have documented that those who are most at risk for developing eating disorders are adolescent, Caucasian females from upper social classes living in a Western society (Fairburn & Harrison, 2003; Stude-Pavlovich & Elliott, 2001; Robb & Smith, 1996; Brown & Bonifazi, 1993; Brownell & Fairburn, 1995). In fact, it is estimated that approximately 95% of all eating disorder cases occur in females between the ages of 12-25 years old

(Kaye, Frank, & Strober, 2000; Fairburn & Harrison, 2003; Renfrew Center Foundation, 2003). It is noteworthy that within recent years, the incidence among 8-11 year olds has increased (Farley, 2000; Faine, 2003).

In Western societies, there is an obsession and preoccupation with weight and appearance, particularly for females. A thin body is often associated with the basic requirement of youth to be thin in order to be considered attractive and accepted (Robb & Smith, 1996; Schmidt & Treasure, 1997; Brown & Bonifazi, 1993; Brownell & Fairburn, 1995). By the age of thirteen, approximately 53% of girls consider themselves “too fat” and are dissatisfied with their bodies (White & White, 2000; Costin, 1999). By the age of eighteen, an estimated 78% of girls are unhappy with their bodies (White & White, 2000). In the absence of better models, many females engage in unhealthy behaviors designed to control their weight, these behaviors lead to cyclical dieting, bingeing and the development of eating disorders (Brown & Bonifazi, 1993; Wadden et al., 2004).

At least 30% of females in the reproductive years engage in pathological weight control activities but do not fit all of the criteria to be diagnosed with a clinical eating disorder (Goldstein, 1999). However, dieting and extreme dieting are recognized as critical risk factors that can lead to the diagnosis of a clinical eating disorder (Marks, Beumont, & Birmingham, 2003; Brownell & Fairburn, 1995).

## Secondary Risk Factors

In addition to primary risk factors associated with eating disorders, there are several secondary risk factors worth consideration. Studies have identified specific personality characteristics as predisposing factors for anorexia and bulimia. These characteristics include difficulty resolving conflict, difficulty communicating negative emotions, lack of coping skills, feelings of emptiness, and perfectionism (Gurenlian, 2002; Schmidt & Treasure, 1997; Goldstein, 1999; Fairburn & Harrison, 2003; Simon & Stern, 2002; Kaye, Frank, & Strober, 2000; Costin, 1999; Brownell & Fairburn, 1995). Ruff, Koch & Perkins (1992) describe yet another personality profile that may predispose an individual to develop an eating disorder. These traits include a striving for perfection, admiring thinness, and associating weight gain with being bad or out of control.

Several social and environmental factors may also play a role. Negative family influences have also been identified as a pre-existing risk factor with several factors believed to play a role in triggering and perpetuating an eating disorder (Simon & Stern, 2002; Faine, 2003; Gurenlian, 2002). Robb & Smith (1996) reported that many families of anorexic patients show over involvement with the child. In addition, one study identified that families of anorexic patients show unresolved conflicts in which the patient attempts to solve family issues by starvation (Robb & Smith, 1996). Clark (1985) describes family dynamics of anorexic patients as being limited, and revolving around food. Families with anorexic patients have also been described as over

protective, high achieving and conflict avoiding (Milosevic, 1999). In such settings, the pre-anorectic child is believed to pursue external approval to fulfill high parental expectations (Clark, 1985).

A parental history of alcoholism is another risk factor associated with eating disorders (Simon & Stern, 2002; Pritts & Susman, 2003; Kaye, Frank & Strober, 2000; Fairburn & Harrison, 2003). Individuals may engage in eating disorder behaviors to serve as a coping mechanism to deal with the parent's alcohol problem (Costin, 1999; White & White, 2000; Schmidt & Treasure, 1997). Costin (1999) further states that individuals with eating disorders see starvation or bingeing and purging as an attempt to deal with difficult situations or emotions.

A history of abuse, including sexual and physical abuse has also been associated with eating disorders in some patients (Costin, 1999; Goldstein, 1999; White & White, 2000; Schwartz & Cohn, 1996). In particular, women with bulimia have a higher reported incidence of sexual abuse, in which the rates are as high as 35% (Costin, 1999; Goldstein, 1999; Schwartz & Cohn, 1996). Bulimics have reported their behaviors as a way of coping with the violator (Costin, 1999). Costin (1999) reports that anorexics describe their behaviors of starvation and weight loss as a way to avoid sexuality due to childhood abuse. Root & Fallon (1988) conducted a study with 172 individuals with eating disorders. Results indicated that 23% had been raped and 28% had been sexually abused as children. In another study of 100

individuals at a residential treatment for eating disorders, 61% reported being sexually abused before the age of 18 (Schwartz & Cohn, 1996).

Genetic factors have also been examined for their potential role as secondary risk factors for eating disorders. One study reported that anorexia is ten times more common in individuals with a family member who has anorexia (Schmidt & Treasure, 1997). Another study using a sample of twins obtained from the Virginia Twin Registry identified a strong association between eating disorders among the twins. The findings showed that a co-twin of a twin with an eating disorder was 2.6 times more likely to have a diagnosis of an eating disorder than co-twins of twins without eating disorders (Kaye, Klump, Frank, & Strober, 2000).

Physiologic factors have also been examined to identify potential associations with the onset of eating disorders. Researchers are investigating the role of certain neurotransmitters that are involved in regulating stress, mood and appetite (Simon & Stern, 2002; Deters, 1998). Among these neurotransmitters are serotonin (5-HT), dopamine and nor epinephrine. Serotonin (5-HT) particularly is known for producing a feeling of well-being and an increase in serotonin leads to a reduction in food consumption and decreases in the chemical are associated with depression and suicide (Simon & Stern, 2002). Individuals with anorexia have been observed to have low levels of serotonin. However, with recovery, serotonin increases to a normal level. Although these studies provide possible clues to biologic mechanisms that may increase risk, more research is necessary to identify whether the levels



contribute to the onset of anorexia or serve as complications of the eating disorder (Gurenlian, 2002).

Another risk factor that has been well documented as being associated with eating disorders is participation in sports that emphasize body shape and weight such as gymnastics, ballet, ice-skating, and swimming (Faine, 2003; Powers & Santana, 2002). Participants in these sports are at a significantly higher risk for developing an eating disorder. This is particularly true since many of the competitive athletes diet at an early age and believe a reduction in body fat will improve their performance (Faine, 2003; Powers & Santana, 2002; Brownell & Fairburn, 1995). In addition, the athletes are under extreme pressure regarding their shape and weight and in some cases they will restrict their food intake as a way to maintain their appearance (Burnell & Fairburn, 1995).

Many athletes and coaches do not view restrictive dieting as problematic. (Faine, 2003; Powers & Santana, 2002). The term “female athlete triad” is used to describe behaviors among athletes that include three common factors: an eating disorder, amenorrhea and osteoporosis. This condition has gained considerable attention by the American College of Sports Medicine in which they are working to provide effective interventions and prevention programs (Burnell & Fairburn, 1995).

Further insight into risk factors, both primary and secondary, is important in order to provide a better understanding of those who are most susceptible to eating disorders. This can assist in providing effective and early interventions

since the physical and psychological complications of anorexia and bulimia can become chronic (Simon & Stern, 2002).

Poor outcomes for eating disorders are associated with a delayed diagnosis and treatment of the condition (Phillip, Willershausen-Zonnchen, Hamm & Pirke, 1991; Faine, 2003). Without early diagnosis and treatment, the symptoms of an eating disorder become much more severe leading to psychiatric comorbidity and premature death (White & White 2000; Roberts & Tylanda, 1989; Brown & Bonifazi, 1993).

The statistics for relapse illustrate the fact that anorexia and bulimia can become chronic conditions (Pike, 1998; Herzog et al., 1999). Even with treatment, statistics indicate that approximately one third of bulimics and anorexics will relapse in the early stages of recovery (Bouqout & Seime, 1997; Herzog et al., 1999; Strober, Freeman, & Morrell, 1997; Pike, 1998). The later in the disease process they are, the worse the prognosis for a full recovery.

Another to early treatment is insurance status. In most cases, insurance is inadequate and does not cover the long recovery period necessary. For example, it is typical for insurance to cover the first 15 days of inpatient treatment, however, chronic anorexia often requires 10-12 weeks of treatment (Simon & Stern, 2002).

Although recovery from eating disorders is possible, the chances for a full recovery from anorexia are much lower than for bulimia. One long-term study followed 225 women with anorexia (95), bulimia (90) or both anorexia and bulimia (40) over a period of 7.5 years to treatment outcome. Results indicated

that 74% of those with bulimia reported full recovery while only 33% of those with anorexia achieved full recovery (Herzog et al., 1999). Therefore, it is extremely important to diagnose and treat eating disorders in the early stages to obtain a better long-term prognosis (Hugo, Kendrick, Reid & Lacey, 2000; Pritts & Susman, 2003).

### **Physical & Psychological Complications**

Without timely diagnosis and treatment, the physical & psychological complications associated with eating disorders can become extensive. It is estimated that at least 50% of those diagnosed with eating disorders also meet the requirements for clinical depression. It is reported that prevalence rates of depression can be as high as 80% in individuals with anorexia (Schmidt & Treasure, 1997; Pritts & Susman, 2003).

Obsessive compulsive disorder (OCD) is also associated with eating disorders and occurs in approximately 40% of those with eating disorders (Eating Disorder Annual Report, 2001). Those with OCD become obsessed with exercise, dieting and food and often develop compulsive rituals. Some of the rituals noted in previous studies include weighing every piece of food and cutting food into tiny pieces (Simon & Stern, 2002; White & White, 2000; Powers & Santana, 2002; Altschuler, 1986; Faine, 2003).

Other anxiety disorders that are characteristic of those with anorexia or bulimia include phobias, especially social phobias, and panic disorders (Gurenlian, 2002; Schmidt & Treasure, 1997; Goldstein, 1999; Fairburn & Harrison, 2003). Johnson, Spitzer & Williams (2001) conducted a study with

over 4000 women, dividing the women into groups including those with bulimia and those without eating disorders. The results showed that women with bulimia were more than three times as likely to have co-occurring anxiety and depressive disorders than women without eating disorders. In addition, women with bulimia were six times more likely to have panic disorders than those without eating disorders.

The psychological symptoms of both eating disorders can be serious and often debilitating (Simon & Stern, 2002). Along with psychological complications individuals with eating disorders also experience a variety of physical complications (Faine 2003; DSM-IV, 1994).

The physical symptoms associated with both eating disorders vary with degree, frequency and duration of the eating disorder behaviors (Gurenlian, 2002; Studen-Pavlovich & Elliott, 2001; Faine, 2003). The physical symptoms associated with anorexia include amenorrhea or loss of menstruation, osteoporosis, osteopenia, loss of heart and brain tissue, and oral manifestations (Studen-Pavlovich & Elliott, 2001; Faine, 2003; Gurenlian, 2002).

Loss of bone density is a serious problem in anorexia that is associated with malnutrition and amenorrhea. It is estimated that fifty percent of individuals with anorexia have bone density measurements that are at least two standard deviations below normal level (Gurenlian, 2002). Adolescent girls are at a greater risk for osteopenia due to the fact that peak skeletal bone mass does not occur until early adulthood. One study of 130 women with anorexia

showed that more than 90% had significant bone loss. This bone loss put them at double the risk for bone fractures and 38% met clinical criteria for osteoporosis (Faine, 2003; Studen-Pavlovich & Elliott, 2001).

The physical symptoms for bulimia include dehydration, cardiovascular complications, esophageal tears, oral manifestations, gastric rupture and electrolyte imbalances (Studen-Pavlovich & Elliott, 2001; Faine, 2003; Gurenlian, 2002). Severe vomiting results in two types of electrolyte imbalances, *hypokalemia* or low potassium and *alkalosis* or high blood alkaline levels. Both of these can cause serious heart irregularities, seizures and muscle spasms (Costin, 1999; Simon & Stern, 2002).

Although some of the symptoms are specific to anorexia or bulimia, dental complications occur in both of the eating disorders (Gurenlian, 2002; Faine, 2003; Studen-Pavlovich & Elliott, 2001). In fact, the oral manifestations associated with anorexia and bulimia can often be the first signs of an eating disorder (Faine, 2003; De Moor, 2004). The specific oral manifestations that occur within both eating disorders include dental erosion, dental caries, enlarged parotid gland, dentin hypersensitivity, xerostomia or dry mouth, periodontal disease and soft tissue lesions as a result of excessive vomiting and gastric acids in the mouth (Rytomaa, Jarvinen, Kanerva, & Heinonen, 1998; Hazelton & Faine, 1996; De Moor, 2004; Faine, 2003). The oral manifestations associated with anorexia and bulimia are often irreversible and require expensive and extensive restorative work (Touyz et al., 1993; Faine, 2003; Hazelton & Faine, 1996).

There can be significant physical complications associated with anorexia and bulimia that include osteoporosis, dehydration, cardiac arrhythmias, and oral manifestations. The oral manifestations in particular have been identified as characteristic symptoms of both anorexia and bulimia through past research studies (Gurenlian, 2002).

### **Eating Disorders and Oral Complication Research Studies**

The dental literature has recognized the association between excessive vomiting and tooth erosion since the early 1930's (Clark, 1985). In 1939, Holst and Lange used the term "perimylolysis" to define the loss of enamel and dentin of the teeth as a result of gastric acids from vomiting (Milosevic, 1999; Hurst & Lacey, 1977). However, this condition was mainly associated with medical illnesses such as peptic ulcers, hernias and as a symptom during pregnancy (Hurst & Lacey, 1977). It was not until the 1970's that there was a recognized association between perimylolysis and eating disorders in the literature (Milosevic, 1999; Hurst & Lacey, 1977).

In 1974, a Swedish researcher named Hellstrom conducted a small pilot study to explore the relationship between eating disorders and dental complications. The study consisted of nine patients with anorexia nervosa. The study showed an association between excessive vomiting and dental erosion among the patients. The results also identified an association between the misuse of carbohydrates and severe dental caries among the nine patients. These initial findings allowed Hellstrom to develop and conduct another study

to further explore these associations between dental complications and anorexia behaviors.

Hellstrom conducted the second study in 1977 that included 39 patients with anorexia nervosa. All of the participants were referred from physicians and dentists in Sweden who confirmed a diagnosis of anorexia for the patients. Since the pilot study in 1974 found that most of the patients with extreme erosion also engaged in excessive vomiting, the patients in this study were divided into two groups, vomiting and non-vomiting.

The patients were given dental examinations and saliva tests. In addition, their medical histories were collected. Statistical comparisons and correlations were calculated and the findings were reported. The results indicated that patients with a history of extensive vomiting showed severe perimyolysis. Hellstrom noted that the patients in the vomiting group also showed buccal erosion, which is caused by consuming large amounts of acidic fruits and beverages. In addition, both the non-vomiting and vomiting groups displayed high amounts of dental caries (Hellstrom, 1977).

Both of Hellstrom's studies are significant, specifically the 1977 study, which was the first to recognize the association between anorexia, vomiting behaviors and perimyolysis. In addition, the findings from this study were critical in identifying that dental symptoms can occur in both vomiting and non-vomiting patients (Hellstrom, 1977).

In 1977, Hurst & Lacey further examined the association between anorexia and dental erosion. The researchers conducted a study that included

17 anorexic patients, 14 female and 3 male, who were patients from St. Georges Hospital in London. The participants were interviewed and examined for dental manifestations. Their dietary histories and eating habits were collected and the analysis confirmed that the patients exhibited a pattern of enamel erosion due to vomiting, regurgitation or consumption of large amounts of citrus fruits. As a result, these findings further confirmed Hellstrom's results that identified the association between dental erosion and anorexia nervosa.

A more recent study was conducted to further identify dental symptoms that are characteristic of anorexia. Montecchi et al., (2003) examined 80 patients from the Neuropsychiatric Unit in Rome who fulfilled the DSM-IV criteria for anorexia nervosa. They were evaluated for oral hygiene, hypersensitivity, and dental erosions. The results indicated a close correlation between oral lesions, including dental erosion and dentinal hypersensitivity with anorexia. Erosions were found in one fourth of the patients, less than half of the restrictive patients had poor oral hygiene. Eighty percent of those who engaged in vomiting had poor hygiene. Therefore, together with the earlier studies described, these results identify important oral symptoms associated with anorexia.

In addition to the research on anorexia and dental complications there have been several studies that have focused specifically on bulimia and oral manifestations. Altshuler, Dechow, Waller & Hardy (1990) conducted a study to identify dental symptoms of bulimia. The sample consisted of 40 females



with a mean age of 23.8 years. The participants were selected from the Eating Disorder Clinic at Texas Southwestern Medical Center or at Baylor University Medical Center Eating Disorder Unit and met the criteria for the DSM III for bulimia. A control group of 35 females were selected from the Baylor College of Dentistry with matched age and race.

In this study, an oral examination was conducted to assess decay, missing teeth, gingivitis, hypersensitivity, erosion, salivary flow and parotid gland enlargement. Standard dental indices were used and Pearson product moment correlations were calculated to determine a relationship between self reported vomiting and certain oral symptoms such as dental caries, dentin hypersensitivity or erosion.

The results revealed a greater prevalence of enamel erosion, dental caries, dentin hypersensitivity and parotid dysfunction in the bulimic group than the control group. Importantly, examination of the tooth erosion concluded that most of the individuals exhibited erosion in the early stages of their eating disorder, approximately 6 months after initiating vomiting behaviors, and the erosion increased over time. Such results provide compelling evidence of an early symptomology that may be particularly susceptible to intervention and treatment.

While dental erosion is one of the key early symptoms, other key symptoms include tooth hypersensitivity and dental caries, both of which must also be treated. Findings indicate that hypersensitivity to hot and cold foods is

a symptom resulting from bulimia and must also be treated. Dental caries are due to the decrease in pH that occurs after vomiting.

In 1991, Spigset also focused specifically on the association between bulimia nervosa and dental complications. The study consisted of 34 women with bulimia nervosa. The women were selected from those who wrote to the Anorexia/Bulimia Association of Norway. They were mailed a 72 item questionnaire regarding their symptoms. The results indicated that 23 of the women reported dental symptoms including hypersensitive teeth, tooth pain, dental fractures and increased dental caries. The dentin hypersensitivity occurred as a result of severe enamel erosion from excessive vomiting, in which the dentin of the tooth becomes exposed during erosion. As a result of the damaged and exposed dentin, the teeth become hypersensitive in which eating, drinking and even brushing the teeth is painful. Results also indicated that the dentists identified the eating disorder among 50% of the women surveyed and that 25% told the dentist on their own.

A more recent study further identified potential precursors to dental symptoms that are characteristic of bulimia. Rytomaa, Jarvinen, Kanerva, & Heinonen (1998) conducted a study of 35 individuals who were diagnosed with bulimia nervosa from the University Central Hospital in Helsinki. The study also included controls that were matched with the experimental group.

Results showed that the experimental group had dental erosion and lower salivary flow rates as compared to the control group. A reduction in salivary flow is associated with individuals who abuse laxatives, diuretics or engage in

frequent vomiting (Gurenlian, 2002). Saliva contains ions that neutralize gastric acids and play a role in protecting the oral mucosa by reducing the duration of the harmful exposure to the teeth from the gastric acid (Faine, 2003; Rytomaa, Jarvinen, Kanerva, & Heinonen, 1998). The findings from this study showed that the salivary flow rates were much lower in the experimental group and therefore acidity in the mouth remained high and tooth erosion and dental caries were also prevalent among the experimental group as compared with the control group. Results showed that tooth erosion and abrasion were 1.5-6 times more frequent among the experimental group than the control group (Rytomaa, Jarvinen, Kanerva, & Heinonen, 1998; Faine, 2003).

Some studies on eating disorders and dental symptoms have included anorexia and bulimia patients. Phillip, Willershausen-Zonnchen, Hamm & Pirke (1991) explored the association between both anorectic and bulimic behaviors and dental erosion. Researchers studied 52 patients, diagnosed with either bulimia nervosa or anorexia nervosa. The study included a control group of 50 individuals who did not have an eating disorder. All of the participants were female and were patients of either the Max Planck Institute of Psychiatry in Munich, Germany or Psychosomatic Hospital Roseneck in Prien, Germany. They were all examined for saliva pH, dental caries, swelling of parotid gland, erosion and tooth loss.

The study indicated that the anorectic diet, which often consists of citrus fruits and acidic foods, resulted in the acid causing the enamel to decalcify

among the anorexia patients. In addition to starvation, the saliva in anorexia patients becomes affected by the electrolyte imbalance which lowers the buffering and remineralizing capacity of the saliva, making teeth more vulnerable to the acid and leads to tooth erosion.

Results showed that overall, the experimental group of both the bulimic and anorexic patients had significantly more enamel erosions than the control group. The findings also indicated that 27 of those engaging in bulimic behaviors showed parotid gland swelling. In addition, trauma to the parotid duct was directly associated with the effects of vomiting.

Ohrn, Enzell & Mansson (1999) also studied both anorexia and bulimia patients to provide further results regarding dental complications associated with these eating disorders. The Swedish study consisted of 62 patients undergoing treatment at an outpatient clinic for either anorexia or bulimia. Sweden provides all individuals 0-19 years of age with dental insurance and dental care. Researchers included a comparison group of 52 individuals without an eating disorder. Oral, medical and dietary histories were recorded and dental examinations and tests were done with a standardized index. The data was analyzed with multiple regression. The analysis showed that dental caries were significantly higher among the eating disorder patients than the control group. Patients also exhibited more extensive erosion and low salivary flow. The majority of the eating disorder patients had significantly higher dental caries, tooth erosion, one third had low salivary flow rates, erosive tooth wear was significantly correlated with the number of years of binge eating.

This further illustrates the importance of timely treatment to increase the chances of a full recovery and reduce the chances of poor outcomes.

### **Multidisciplinary Treatment approach**

Treatment for eating disorders has primarily been focused on medical supervision, psychotherapy, nutritional counseling and medication. The type of multidisciplinary treatment for eating disorder patients ranges from inpatient hospitalization, partial hospitalization or outpatient treatment (Spearing, 2001; Costin, 1999; Goldstein, 1999; American Dietetic Association, 2001).

Initial treatment for anorexia is focused on normalizing and restoring weight with medical supervision (Spearing, 2001; Costin, 1999; Goldstein, 1999). Depending on the severity of the disorder, inpatient treatment at an eating disorder clinic or hospital may be required. Factors that determine the need to hospitalize a patient include weighing 30% below minimum needed weight to maintain health, suicidal thoughts, severe medical complications such as abnormal heart rhythms or dangerously low blood pressure (Simon & Stern, 2002; Costin, 1999; Goldstein, 1999).

Partial hospitalization is another treatment option for anorexia and is administered when the patient is in need of medical attention but the symptoms can be monitored without full admission into a hospital or clinic. This type of treatment consists of the patient going to the hospital for 7-10 hours a day in which they have 2 meals at the hospital and the patient is responsible for one meal at home (American Dietetic Association, 2001).

Outpatient care is the third type of treatment for individuals with anorexia. This form of treatment is carried out when the patient's symptoms can be treated in the physician's office. Outpatient treatment is less structured and consists of the individual scheduling regular visits with each member of their treatment team to receive nutritional counseling, psychotherapy and medical management (American Dietetic Association, 2001; Thompson, 2004).

Since the majority of individuals with bulimia maintain normal body weight, hospitalization is usually not necessary unless the patient has major depression, severe metabolic abnormalities, or the patient is also anorexic and severely underweight (Simon & Stern, 2002; Costin, 1999; Goldstein, 1999). Medical treatment for bulimia is focused on correcting electrolyte imbalances, dehydration and other physical complications.

After medical attention has been provided and management of the physical symptoms is established, psychotherapy is the next crucial component to the multidisciplinary treatment. Psychotherapy is essential to correct dysfunctional thought patterns and to address underlying issues such as abuse and negative family relationships (Goldstein, 1999; Costin, 1999; Simon & Stern). Cognitive Behavioral Therapy (CBT) is commonly used with anorexia and bulimia patients and has been referred to as the "gold standard" for treating eating disorders (Costin, 1999; Goldstein, 1999; Fairburn & Harrison, 2003; Gurenlian, 2002).

CBT was initially developed by Aaron Beck in the 1970's to treat patients with depression (Costin, 1999; Goldstein, 1999; Thompson, 2004). The

therapy technique is focused on helping individuals to learn to recognize distorted patterns of thinking such as magnifying, minimizing, personalizing. Clinicians began using this technique with eating disorder patients, since these distorted patterns of thinking are expressed through eating behaviors such as restricting foods and excessively bingeing (Costin, 1999; Gurenlian, 2002; Goldstein, 1999). CBT techniques also focus on issues regarding body image, weight, self expectations and self esteem (Gurenlian, 2002). Treatment is most effective when there is an early diagnosis.

If the patient is still living at home, family therapy may also be required to address family issues that may be attributed to the eating disorder. The initial focus of family therapy is to help the family members to cope and deal with the patient's eating patterns (Goldstein, 1999).

Co-morbid psychological conditions such as depression and anxiety disorders including OCD are also a focus in psychotherapy. In many cases, management of these disorders requires antidepressants known as serotonin reuptake inhibitors (SSRI's) such as Prozac, Zoloft and Paxil (Goldstein, 1999; Simon & Stern, 2002; Costin, 1999). These drugs are particularly effective with bulimia in reducing vomiting episodes by as much as 56% (Simon & Stern, 2002; Kaye, Frank, & Strober, 2000).

Nutritional counseling by a registered dietician is the next essential component of the multidisciplinary treatment (Gurenlian, 2002; American Dietetic Association, 2001; Brunell & Fairburn, 2001). The registered dietician assesses the current knowledge base, motivation, nutritional status

and behavioral patterns of the individual in order to develop an appropriate treatment plan (American Dietetic Association, 2001). The dietician works with the patient in addressing fears about food and eliminating ritualistic patterns of eating. In some cases, the dietician may recommend supplements to correct nutritional deficiencies. In addition, because compulsive exercise is common in eating disorders, the dietician may need to limit physical activity for the individual (American Dietetic Association, 2001).

For anorexia patients the refeeding process must be closely monitored to prevent the refeeding syndrome which is characterized by sudden drops in potassium and magnesium, gastrointestinal dysfunction and cardiac arrhythmias known as (American Dietetic Association, 2001; Brunell & Fairburn, 1995). The dietician should work with the individual to guide them with food choices in which the recommended weight gain should be 1-2 pounds a week for anorexic outpatients and 2-3 pounds for anorexic inpatients (American Dietetic Association, 2001). For bulimic patients, weight loss may be necessary in which careful monitoring is required by the dietician and working with the patient to understand appropriate portion sizes. In addition, the dietician also must address any laxative or diuretic abuse and work with the patient to eliminate these behaviors. The ultimate goal of nutritional therapy is to establish healthy eating patterns and a normal weight for individuals with either anorexia or bulimia (Gurenlian, 2002; Brunell & Fairburn, 1995). The American Dietetic Association (2001) recognizes that this is a lengthy process and the dietician should be part of the long term care plan for patients with



eating disorders. In addition, it is important for the dietician to communicate with other health professionals to monitor how nutrition affects the other symptoms of the eating disorder.

A pilot study was conducted in 1990 to explore the effectiveness of communication between the dietician and dentist in assessing the dental health of individuals with bulimia (Howat, 1990). The study included 10 women diagnosed with bulimia and 10 individuals from the university population without an eating disorder to serve as the control group. The participants in the experimental group were selected through the university eating disorder clinic at Louisiana State University. An assessment of the diet was documented for all patients regarding their nutritional intake. The results showed a significant difference of folacin and the experimental group showed lower saliva pH. The dentist and dietician worked closely to monitor the dental health of the experimental group. The study emphasized numerous dietary concerns regarding bulimics and their behaviors that influence their dental health such as laxatives, diuretic abuse, and consumption of acidic foods. Therefore, continual communication between dieticians and dentists along with the other professionals in the treatment team is necessary for effective ongoing treatment of the individual.

The dentist should be another necessary component since dental manifestations are recognized as characteristic symptoms of eating disorders, often the first symptoms (Bouqout & Seime, 1997; Burke, Ismail, & Hartley, 1996; Woodmansey, 2000; Gurenlian, 2002; Hazelton & Faine 1996). The

dentist should be involved to provide ongoing management and treatment of oral symptoms along with the other physical and psychological symptoms associated with anorexia and bulimia. This includes emergency care, patient education, pre restorative care, restorative care and maintenance (Burke, Ismail, & Hartley, 1996). The dental care should initially be focused on reducing the destruction of the oral tissues (Roberts & Tylanda, 1989). This can include encouraging the patient to rinse with a sodium bicarbonate solution to neutralize the acids in the mouth and discouraging the patient from brushing immediately after a vomiting episode to prevent additional damage to the teeth (Gross, Brough, & Randolph, 1986; Gurenlian, 2002; Studen-Pavolich & Elliott, 2001). After the patient has received adequate treatment and stopped the eating disorder behaviors, reconstructive treatment can be done to repair the damage from the eating disorder (Hazelton & Faine, 1996).

Oral symptoms are easily distinguishable during a regular dental exam and dentists have been acknowledged in the literature as being the first clinician to recognize symptoms of eating disorders (Bouqout & Seime, 1997; Burke, Ismail, & Hartley, 1996; Faine, 2003; Schmidt & Treasure, 1997). As a result, they serve another critical role by initiating the treatment process and referring the patient for medical and psychological attention (DiGiacchino, Keenan & Sargent, 2000; Faine, 2003). This is particularly important since the previous statistics show that early diagnosis and treatment significantly increases the chance for a full recovery. In fact, dentists are the main health professional that can recognize the early symptoms of an eating disorder and other

clinicians, particularly primary care physicians, are often unable to detect eating disorders (Karwautz, Wober-Bingol, Wober & Friedrich, 1997; Burke, Ismail, & Hartley, 1996; Brewer, 1987).

### **Primary Care Physicians**

Several studies have shown that primary care physicians frequently are not aware of patients with eating disorders because of a lack of visible symptoms (Karwautz, Wober-Bingol, Wober & Friedrich, 1997; 1997; Hugo, Kendrick, Reid, & Lacey, 2000; Maradiegue, Cecelic, Bozzelli, & Frances, 1996; Sayag & Latzer, 2002; Bursten et al, 1996; Morgan, 1999; Deters, 1998). It is estimated that at least 50% of eating disorder cases go undetected in the clinical setting (Marks, Beumont, & Birmingham, 2003; Karwautz, Wober-Bingol, Wober & Friedrich, 1997). Maradiegue, Cecelic, Bozzelli, & Frances (1996) state that primary care physicians lack the necessary tools and instruments to detect eating disorders. Boule & McSherry (2002) surveyed 202 family physicians regarding various aspects of eating disorders, including training and education. The results showed that 59% of the sample rated the quality of their medical training in eating disorders as poor. Furthermore, Bursten, Gabel, Brose, & Monk (1996) reports that primary care physicians have limited experience with eating disorders.

Many patients with anorexia or bulimia hide their eating disorder from their primary care physician because of fear, guilt, shame or denial (Marks, Beumont, & Birmingham, 2003; Maradiegue, Cecelic, Bozzelli, & Frances, 1996). It has been reported that patients will go to extreme lengths to avoid

revealing their true weight such as placing weights in their pockets, wearing heavy clothing, or drinking extra fluids (Pritts & Susman, 2003).

Research indicates that although patients attempt to hide their eating disorder, many patients do provide hints to the physician (Karwautz, Wober-Bingol, Wober & Friedrich, 1997). Marks, Beumont, & Birmingham (2003) reported that as many as 90% of eating disorder patients state some symptoms of their eating disorder in hopes that the physician will ask more questions. However, many of the medical symptoms of early eating disorders can be non-specific that includes dizziness, fatigue, abdominal pain or cold intolerance that the physician does not associate with eating disorders (Marks, Beumont, & Birmingham, 2003; Pritts & Susman, 2003). In addition, patients with bulimia, even in the severe stages, maintain normal body weight and normal laboratory results (Maradiegue, Cecelic, Bozzelli, & Frances, 1996; Bursten, Gabel, Brose, & Monk, 1996; Karwautz, Wober-Bingol, Wober & Friedrich, 1997; Sayag & Latzer, 2002).

Primary care physicians are not detecting and diagnosing eating disorders because of a lack of training regarding eating disorders and a lack of visible medical symptoms (Karwautz, Wober-Bingol, Wober & Friedrich, 1997; Hugo, Kendrick, Reid & Lacey, 2000; Maradiegue, Cecelic, Bozzelli, & Frances, 1996; Deters, 1998; Boule & McSherry; 2002). However, tooth erosion is a visible sign that can be detected in the early stages of an eating disorder through a regular dental exam (Bouqout & Seime, 1997; Faine, 2003; Gurenlian, 2002). As a result, dentists, not primary care physicians, can be the

first clinician to diagnose anorexia or bulimia. Despite the fact that dentists can be the first clinician to recognize eating disorders, little is known about intervention strategies dentists are utilizing with suspected patients (Silber & Wynne, 1999).

### **Tobacco and Dental Care Interventions**

Although there has been a lack of research on dentist-patient communication in some areas of dental health, other areas such as tobacco use have been researched to provide specific strategies for dentists. Like eating disorders, tobacco use also causes oral damage. Even though the symptoms are different for tobacco use such as an increased risk of oral cancer and periodontitis or inflammation of the gums, it is a sensitive issue to discuss with patients that also requires an intervention (Tomar, 2001). Dentists have been effective in working with suspected or identified smokers by providing supports to improve health, and reduce oral health risks through clinical practice guidelines known as the 5A's: *Ask, Advise, Assess, Assist, and Arrange* (Yip, Hay, Ostroff, Stewart & Cruz, 2000; Fiore, 2000). These clinical guidelines have been recommended by the US Public Health Service to use in their offices, including dentists (Havlicek, Stafne & Pronk, 2006; Yip, Hay, Ostroff, Stewart & Cruz, 2000; Fiore, 2000).

Numerous studies have demonstrated the importance of the 5A's; asking patients about their smoking behaviors, advising them about the harmful effects of smoking, assessing the patient's willingness to quit, assisting patients in becoming more aware of potential resources to stop smoking and arranging

follow-up contacts to prevent relapse (Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997; Warnakulasuriya, 2002; Barker & Williams, 1999; Shelley et al, 2005; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1999). The 5A's have been shown to be effective within the clinical setting by increasing quit rates by as much as 34% among patients that smoke (Donatelle, Hudson & Prows, 2002, Fiore, 2000; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1997; Warnakulasuriya, 2002, Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997) (see Table 2.3).

**Table 2.3 The 5A's Guidelines for Tobacco Use**

<p><b>Ask:</b> At each visit, ask the patient if they use tobacco</p>
<p><b>Advise:</b> Urge the tobacco user to quit in a clear, strong and personalized Approach:          “I think it is important for you to quit smoking now, and I can help you”          “As your clinician, I need you to know that quitting smoking is the most important thing you can do to protect your health now and in the future. The clinic staff and I will help you”</p>
<p><b>Assess:</b> Determine the patient's willingness to quit:          Is the patient willing to attempt to quit?          Is the patient willing to participate in a treatment program?</p>
<p><b>Assist:</b> Aid the patient in quitting          Help the patient establish a quit plan          Provide practical counseling/problem solving skills          Recommend the use of pharmacotherapies such as nicotine gum and the nicotine patch          Provide the patient with supplementary materials</p>
<p><b>Arrange:</b> Schedule follow-up contact with the patient to prevent relapse</p>

United States dental schools have increased the amount of information and training they provide on tobacco interventions. The University of Minnesota School of Dentistry serves as one example of a dental school that provides a comprehensive program on tobacco intervention and prevention. Within the program, all dental students are required to practice the 5A's with patients in the dental clinics. The dental students are then required to discuss one of these interventions with the program director (Stafne & Bakdash, 2004). Additional support is provided for clinician use of a 5A standard for tobacco interventions by the endorsement of several medical and dental organizations (Shelley et al, 2005). For example, American Dental Association supports tobacco intervention and encourages its members to be educated on tobacco interventions and to educate their patients on tobacco use (Havlicek, Stafne & Nicolaas, 2006).

Since these guidelines have been beneficial regarding tobacco interventions, similar guidelines could be created to assist dentists with other oral health issues that involve behavior change. Anorexia and bulimia, in particular, are health issues that require early detection and intervention in order to significantly increase the chances for a favorable outcome (Brown & Bonifazi, 1993; Marks, Beumont, & Birmingham, 2003). Identifying factors associated with dentists intervening and developing effective guidelines similar to the 5A's with tobacco could provide significant results.

### **Factors Influencing Dental Interventions for Eating Disorders**

Little is known about what factors may influence how often dentists engage in the intervention strategies (Silber & Wynne, 1999; DiGioacchino, Keenan & Sargent; 2000). DiGioacchino, Keenan & Sargent (2000) conducted a pilot study that consisted of a questionnaire based to assess the involvement in the secondary and tertiary prevention of eating disorders among dentists and dental hygienists.

The results indicated that the dentists and dental hygienists surveyed were unaware of the health implications of eating disorders. The results indicated that 72.2% of dentists and 68.4% of dental hygienists suspected their patients of disordered eating but only 44.4% of dentists and 31.6% of hygienists approached the patient and only 44.4% of the dentists and 21.1% of the hygienists referred the patient for treatment.

However, the results should be taken with caution since it was a pilot study conducted on small convenience sample of 37 participants. This pilot study has been the only study to survey dentists to identify various factors that could impact intervening with patients suspected of an eating disorder (DiGioacchino, Keenan & Sargent; 2000). Further research is needed to explore specific theoretical frameworks that can be applied when addressing factors associated with dental care and eating disorder interventions.



### **Diffusion of Innovations**

Diffusion theory is defined by Rogers as the process by which a practice or program is communicated to members of a social system (Glanz, Rimer, Lewis, 2002; Rogers, 1983). The purpose is to maximize the reach of strategies or programs and involves five stages: innovation development, dissemination, adoption, implementation and maintenance.

Innovation includes activities and decisions in the early stages of its development. In this initial stage it is important to develop a framework for the program. Dissemination, the second stage of the theory consists of an active transfer to the users and identifying means of communication to deliver the innovation or to the audience. The third stage, adoption, involves the users receiving the program and addressing concerns about the innovation and factors influencing the adoption. In this stage, barriers to using the program are addressed. Implementation, the fourth stage, is the actual use of the program on a continual basis. Here the main issues are self-efficacy and skills of the adopters. The final stage is maintenance, which is the ongoing use of the program and achieving sustainability of the program (Glanz, Rimer, & Lewis, 2002; Vickrey, 2006; Sanson-Fisher, 2004).

Diffusion theory has been used in numerous public health issues including safe sexual practice, workplace health and tobacco use (Glanz, Rimer, & Lewis, 2002). Tobacco use in particular has utilized the theoretical approach in creating effective smoking cessation programs and interventions. Diffusion

theory has been used to assist individuals to quit smoking and to create smoke free policies in workplaces, restaurants, and community facilities (Glanz, Rimer, & Lewis, 2002). The theory is also widely used to implement clinical guidelines and standards of practice for practitioners in the medical setting (Glanz, Rimer & Lewis, 2002). Davis & Taylor-Vaisey (1997) conducted a review of literature to explore the compliance of clinical practice guidelines (CPG) among physicians relating to specific medical conditions including breast cancer and surgical procedures. The authors utilized diffusion theory to identify factors related to dissemination, adoption and maintenance of the clinical practice guidelines. The results of the literature search indicated that social norms, environmental considerations, such as practice location, demographics, setting and patient issues were associated with adoption and maintenance of the guidelines (Davis & Taylor-Vaisey, 1997). By identifying characteristics associated with adoption of guidelines, diffusion theory can facilitate the acceptance and sustainability of medical practices (Vickrey, 2006; Sanson-Fisher, 2004).

Since diffusion theory has been successful with other public health interventions and it is recognized as a theoretical framework for disseminating clinical guidelines to practitioners, it could be used when addressing dental care interventions for eating disorders. The five stages can parallel the process of developing guidelines for dentists to use with patients suspected of an eating disorder. Innovation would include the development of specific guidelines for dentists to use with suspected patient. Dissemination would be

the how the intervention would be carried out by the dentist and dental staff. Adoption would involve the dentists receiving the intervention strategies and addressing concerns and factors influencing the adoption. Specifically, perceived barriers such as lack of confidence in ability or lack of knowledge would be addressed. Implementation would be the dentists' utilization of the intervention strategies and practicing it on a continual basis. Skills and self efficacy would be considered. The final stage of maintenance would be the ongoing use of the intervention and achieving sustainability. When addressing these key components of diffusion theory and implementing the five stages, it is important to also identify factors associated with the delivery and adoption of the intervention and the dentists' ability to communicate with patients suspected of an eating disorder.

### **Dentist-Patient Communication**

Since the dentist can be the first health professional to diagnose eating disorders, communication with the patient about their behaviors must be carried out in a specific way (DiGiacchino, Keenan, & Sargent, 2000; Brewer, 1987; Bianco, 1991; Carni, 1980). Individuals with eating disorders have special needs and it is important to develop models for dentists to assist them in effectively communicating with the patient (Schmidt & Treasure, 1997; DiGiacchino, Keenan & Sargent, 2000). Often, individuals with eating disorders have low self-esteem, are ashamed of their problem and are depressed (Faine, 2003; Schmidt & Treasure, 1997; Bouqout & Seime, 1997).

Bouqout & Seime (1997) noted that individuals with bulimia exhibit a fear of rejection and a constant need for approval from others.

Confrontational approaches are not effective in addressing eating disorders among patients because individuals with eating disorders often deny a problem and they can be secretive and guilt-ridden about their behaviors (Harrison, George, Cheatham, & Zinn, 1985; Adler 1985; Bouqout & Seime, 1997). Gentle questioning in which the patient does not feel criticized helps to create a discussion in which the patient feels the dentist is on his/her side (Schmidt & Treasure, 1997). These types of questions include “Are you satisfied with your eating pattern?” and “Do you ever eat in secret?” (Faine, 2003). These two questions have been shown to have high sensitivity and specificity for diagnosing both anorexia and bulimia, especially because the patient responds with a yes or no and does not have to give specific details (Faine, 2003).

Patient-dentist relationship models in general are also necessary since dentists receive minimal training on eating disorders and may not know how to communicate with the patient regarding their behaviors (Silber & Wynne, 1999; DiGiacchino, Keenan & Sargent; 2000).

According to Sondell & Soderfelt (1997) the dental visit is set up differently than other medical settings. When a patient has a check-up with a physician, it includes an interview, investigation, diagnosis, treatment, progress review and advice in a private room (Sondell & Soderfelt, 1997). However, the dentist visit involves a routine oral check-up and possibly treatment performed in a chair surrounded by equipment (Sondell & Soderfelt, 1997). As

a result, the communication process can be impacted by anxiety on the part of the patient because of the oral exam and possible treatment with various instruments (Sondell & Soderfelt, 1997). These patients who are more anxious and worried about their visit can benefit more from dentists that are interpersonally involved (Mataki, 2000; Sondell, Palmqvist, & Soderfeldt, 2004).

Sondell & Soderfelt (1997) identify that a good interpersonal relationship is one of the key purposes of communication in the context of the patient-dentist encounter. A positive dentist-patient relationship can lead to less stress for the patient and better compliance regarding treatment. The dentist's behavior that can be conducive to good communication includes being calm, empathetic, reassuring and encouraging to the patient (Sondell & Soderfelt; 1997; Mataki, 2000).

Mutuality of the communication process is recognized as another important concept in which patients should be involved in the decision process and there should be an exchange of information between the patient and dentist (Glanz, Lewis & Rimer, 2002). Since dentists rely on the patient to provide information regarding their condition, the patient must feel understood by the dentist to disclose the information. Because of this an authoritarian approach from the dentist can negatively influence the communication process (Sondell & Soderfeldt, 1997). Physician-patient models of communication have also shifted away from this authoritarian or paternalistic approach and more towards shared decision making (Ong, DeHaes, Hoos, & Lammes, 1995;

Charles, Gafni, & Whelan, 1997; Charles, Gafni, & Whelan, 1999; Quill & Brody, 1996). This interactive process is a crucial aspect in the dentist-patient relationship particularly when making treatment related decisions (Sondell & Soderfeldt, 1997).

One study investigated patients' and dentists' communicative behavior and their satisfaction with the encounter (Schouten, Eijkman & Hoogstraten, 2002). The sample consisted of 90 patients receiving emergency care from a total of 13 different dentists in the Netherlands. Each visit was videotaped and the patient and dentist filled out questionnaires after the visit regarding the satisfaction of the encounter. Results showed that patients who asked more questions were more satisfied with the dentist's communicative behavior, further illustrating the importance of a mutual relationship. In addition, dentist's satisfaction with their own communicative behaviors and the patient's communicative behavior was higher for patients who were more active in the process and attempted to self diagnose than those who were not active in this process. This study concluded that it was essential for the patient to have an active role in the encounter and be involved in the communication process to enhance satisfaction of the overall visit.

Another study was conducted examining the dentist's communicative role in prosthodontic treatment (Sondell, Palmqvist, & Soderfeldt, 2004). The study consisted of 61 dentist-patient pairs that were followed for one year. All patients were receiving prosthodontic treatment that required multiple visits and each visit was tape-recorded and questionnaires regarding communication

patterns were completed by the patients. The questionnaires were distributed at two different times during the year, in the middle of the year during the treatment and at the end of the year when the treatment was completed. The questionnaire distributed in the middle of the year included questions about satisfaction with the dental encounters which was termed as “care”. The questionnaire distributed at the end of the year asked about the overall treatment and was termed as “cure”. The results showed that the dentists’ communication patterns influenced patient satisfaction short term regarding “care”, but not at the end of the year regarding “cure” when their treatment was completed. This study indicated that dentist’s verbal communication is important to patients during the procedures, but more studies need to be done to identify if it affects their overall perception of the treatment.

Few models currently exist regarding dentist-patient communication in general and there is a need to develop effective models to assist dentists in communicating with patients, particularly about sensitive issues. Theoretical constructs and frameworks in communication should also be incorporated into the dentist-patient communication models. The theoretical frameworks and constructs that should be considered include Interdependence Theory, Risk Communication and Social Cognitive Theory (Glanz, Lewis, & Rimer, 2002). This is important since good communication can positively affect the outcome of the dental visit and reduce the stress and anxiety of the patient (Mataki, 2000; Sondell & Soderfeldt, 1997).

## Stigma

Another important component to consider when addressing the issue of communication with an individual who has an eating disorder is stigmatization. Two nationwide surveys regarding stigmatization and mental illness were conducted in England, Scotland and Wales in 1998 and 2003. The UK Office for National Statistics randomly selected a sample of 1737 adults and asked them several questions regarding seven mental illnesses, including eating disorders. The results from both surveys showed that people with eating disorders are viewed negatively (Crisp, 2005; Crisp, Gelder, Meltzer, Rowlands, 2000). At least one third of the sample perceived people with eating disorders as “difficult to empathize with and difficult to talk to” (Crisp, 2005). In addition, one third of the sample also perceived individuals with eating disorders as “self-inflicted” in which they “have only themselves to blame” and they “could pull themselves together”. Crisp (2005) further explains these statements as implying personality weaknesses and that people with eating disorders could “choose” different behaviors.

Stigmatization of individuals suffering from eating disorders has various origins, including the fact that eating disorders are trivialized and not seen as a serious condition and that those with eating disorders are seen as “weak-willed” (Crisp, 2005; Crisp, Gelder, Meltzer & Rowlands, 2000). In addition, this stigmatization of people with mental illnesses including eating disorders contributes to their low self esteem and promotes further denial, secrecy and decreases the person’s ability to communicate. This inability to communicate



generates a social handicap identified with mental illnesses and leads to social avoidance, increasing the severity of their mental illness (Gowers & Shore, 1999; Crisp, 2005).

Corrigan and Watson (2002) identify three factors; education, contact and protest, that are important in reducing stigmatization of those with mental illnesses. Contact in particular is important and consists of identifying skills for helpful communication with a person suffering from an eating disorder. These skills that include empathy and listening to the individual's needs are especially important for health care workers to effectively treat the patient. Proper training and education are also important in reducing stigmatization of patients with eating disorders in the medical profession (Crisp, Gelder, Meltzer & Rowlands, 2000). As a result, this provides opportunities for effective treatment for individuals with eating disorders and reduces the chance for isolation by the patient (Gowers & Shore, 1999). Thus, stigma is a critical factor to address regarding communication between clinicians and patients with eating disorders (Gowers & Shore, 1999, Crisp, Gelder, Meltzer & Rowlands, 2000).

### **Conclusion**

Past research studies have identified key dental symptoms that are characteristic of both eating disorders. The literature has also established that oral symptoms can be the most visible and often the first signs of an eating disorder (Bouqout & Seime, 1997; Alschulter, Dechow, Waller & Hardy, 1990; Burke, Ismail, & Harley, 1996; Faine, 2003; Studen-Pavovlich &

Elliott, 2000). Because of this, dentists have a unique role regarding the recognition of eating disorders in the early stages to increase the chances for a full recovery (DiGiacchino, Keenan, & Sargent, 2000; Phillip, Willershausen-Sonnchen, Hamm, & Pirke, 1990; Gurenlian, 2002). The purpose of this study was to: 1) identify potential strategies that experts believe are important for dentists to utilize when intervening with patients suspected of an eating disorder 2) determine the nature and extent of current intervention strategies for eating disorders by dentists 3) identify factors that influence how often the dentists utilize intervention strategies for eating disorders. By exploring the current situation regarding dental care for eating disorders, potential areas for improvement can be identified to increase the likelihood of early diagnosis. (Burke, Ismail, & Harley, 1996; Woodmansey, 2000; Brown & Bonifazi, 1993; Marks, Beumont, & Birmingham, 2003).

## **CHAPTER 3**

### **METHODOLOGY**

The study consisted of two parts; Part I involved surveying experts to explore the roles and responsibilities of dentists with patients suspected of an eating disorder by developing a list of potential intervention strategies as identified by the experts. In Part II of the study, Oregon dentists were surveyed to determine which of these intervention strategies are currently being used for patients suspected of an eating disorder. Selected factors were examined to identify their influence on dentist's delivery of intervention strategies modeled after the strategies used for tobacco use. Recommendations from this study provide a set of potential intervention strategies that can be used as a starting point in developing guidelines for dentists to use with patients suspected of an eating disorder.

#### **PART I: DEVELOPMENT OF INTERVENTION STRATEGIES FOR DENTISTS TO USE WITH PATIENTS SUSPECTED OF AN EATING DISORDER**

##### **Sample Selection**

For Part I of the study, the Delphi technique was utilized to create a set of the most important dental care intervention strategies for eating disorders as perceived by the experts. Experts were identified and selected based on one of two criteria: 1) those who were published in either dental interventions or eating disorder research and 2) those who were active in the eating disorder field through private practice, and membership in professional organizations. The experts' business phones, emails, and mailing addresses were obtained by

accessing their business websites and obtaining personal information that was publicly available.

After approval from the Institutional Review Board (IRB) at Oregon State University, the experts were contacted by either phone or email and asked to participate via a standardized script soliciting participants. These experts were contacted and a total of thirty agreed to participate. Seven of the experts were identified in the area of dental interventions, thirteen experts were identified in the area of eating disorder research and ten experts were identified based on their activity and private practice involvement in the area of eating disorders.

### **Survey Instrument**

#### Round 1

A one page survey was developed by the researcher through an exhaustive search of the literature (see Appendix A). The most common intervention strategies that were recommended in the literature for dentists to carry out with patients suspected of an eating disorder were listed on the survey. There were a total of fourteen potential intervention strategies identified through this process. The experts were asked to rate each strategy as “extremely important”, “somewhat important” or “not important”.

#### Round 2

The Round 1 responses were compiled, reworded and the top nine were selected for inclusion in Round 2. For the revised Round 2 survey, the experts were asked to rate the nine potential intervention strategies as to their relative

importance. Two questions were included to gather additional information from the experts. The total length of the survey for Round 2 was two pages (see Appendix A).

### **Procedure for Data Collection and Analysis**

The Dental Care and Eating Disorders Delphi Survey was mailed to each expert along with a letter describing the purpose of the research, instructions for completing the survey, an informed consent form, a self-addressed stamped envelope and contact information for the researcher.

For Round 1, the experts rated the strategies based on those they believed were the most important for dentists to perform whenever they suspect an eating disorder. The experts completed the survey, and returned it in the self-addressed stamped envelope that was provided. Reminders were sent one and two weeks later to those who had not sent back their survey. A total of 23 experts out of the 30 completed the survey for a response rate of 76 %. The Statistical Package for the Social Sciences (SPSS) Version 13.0 for Windows was used to calculate frequencies for the data (SPSS, Inc., Chicago, IL). The researcher created another survey based on the strategies that were identified as most important from Round 1 by examining the frequencies for each response and comments from the experts.

Round 2 involved sending the revised survey to the same 30 experts. The experts returned the survey in the self-addressed stamped envelope and reminders were sent one and two weeks after initial mailing. A total of 16 experts out of the original 30 sent back the survey for a response rate of 53%.

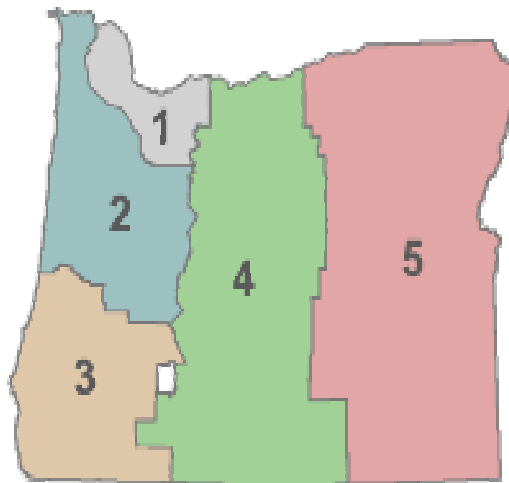
Frequencies were examined for each strategy along with comments from the experts. As a result, all nine of the strategies were identified by the experts as the most important that a dentist should do with patients suspected of an eating disorder, with two of the strategies being modified from experts' comments. These nine strategies serve as a preliminary set of intervention strategies that the experts identified as important for a dentist to carry out with a patient suspected of an eating disorder.

## **PART II: NATURE AND EXTENT OF DENTAL CARE AND EATING DISORDERS IN OREGON**

### **Sample Selection**

In Part II of the study, a sample of Oregon dentists were surveyed to identify what they are currently doing with patients suspected of an eating disorder. A list of all licensed Oregon dentists was purchased through a written request to the Oregon Board of Dentistry. The list contained the mailing addresses of 2543 Oregon dentists holding a DDS or DMD degree as of January 2005. From this list, dentists were grouped together based on their geographic region within the state of Oregon according to the Oregon Department of Transportation. The Oregon Department of Transportation geographically divides the state of Oregon into five regions, which are assigned a number from 1 to 5 (see Figure 1).

**Figure 1: Regions of Oregon**



To insure a representative sample of dentists, stratified proportional random sampling was the method of selection used in this study (Portney & Watkins, 2000). Regions 4 and 5 were low in population of dentists, so they were combined and labeled as Region 4 & 5, to give a total combined population of 254 for both regions (see Table 3.1).

Power analysis was calculated with the program Power and Precision Version 2 (Biostat, 2000 ). Using a medium effect size of .15 and a power of .90, a minimum of 130 participants total was required for the study (Biostat, 2000, Cohen, 1992). To insure an adequate response rate and to achieve a representative sample, 30% of each region was selected for a total sample size of 763 (Salant & Dillman, 1994) (see Table 10). Dentists were randomly selected from each region using the random number generator, Research Randomizer, to identify the sample for that region (Urbaniak & Plous, 2006).

**Table 3.1 Sample Selection of Oregon Dentists**

Region	# of Dentists	30% of Region
Region 1	1423	427
Region 2	593	178
Region 3	273	82
Region 4 & 5	254	76
Total	2543	763

### Survey Instrument

#### Dental Care and Eating Disorder Survey

An 18-item survey was developed by the researcher (see Appendix C). The first eleven questions were designed to elicit demographic and background information including gender, age, years as a practicing dentist, location of dental office and size and type of dental office. Question 12 used a Likert scale of 0 (not at all) to 4 (a lot) and was comprised of 8 parts that asked about the amount of education dentists received on eating disorders during dental school. Question 13 asked how much information/training dentists received in dental school on eating disorders. Question 14 asked whether dentists received any courses on other sensitive topics during dental school. Question 15 asked how many eating disorder related activities dentists have participated in within the past two years. Question 16 used a Likert scale of 0 (not important) to 4 (very important) and was comprised of 5 parts that asked dentists how important they believed it was that specific intervention strategies were used with patients with eating disorders. Question 17 was utilized a Likert scale of 0 (not a problem) to 4 (major problem) and included seven parts that asked how much of a barrier dentists perceived that certain factors would



be in working with eating disorder patients. Question 18 used a Likert scale of 0 (never) to 4 (always) and asked the dentists to rate how often they performed each of the nine intervention strategies developed from Part I of the study for patients with eating disorders. An area labeled “Comments” followed each question to allow for dentists to include additional information relating to that particular question. At the end of the survey, a final question was asked to identify whether the dentists had any further information they would like to share regarding eating disorders and dental care.

Before the survey was administered, experts consisting of faculty and graduate students in Public Health at Oregon State University examined the survey for content and face validity. The survey was then pilot tested with a sample of 8 Oregon dentists to establish readability, face and content validity.

### **Procedure for Data Collection**

The survey, a self-addressed stamped envelope, a letter of informed consent and a cover letter including survey instructions, a description of the research study and contact information for the researcher was sent to each dentist. The surveys were coded to identify those who did not return the surveys (Portney & Watkins, 2000). The completed surveys were sent back to the university mailing service. Approximately one week after the initial mailing was sent, a follow-up postcard was sent out to those who had not responded reminding them to complete the survey and mail it back to the researcher (Portney and Watkins, 2000). Three weeks after the initial mailing, a second reminder postcard was sent to the dentists who had not responded.

Several dentists called the researcher after receiving a reminder card, requesting another survey to be sent to them. After the second reminder postcard was sent out, the response rate was still low and the researcher obtained the phone numbers for the dentists in the sample and called those who had not returned the survey. The total number of dentists who returned their survey was 387 for a final response rate of 50%.

### **Procedure for Data Analysis**

The Statistical Package for the Social Sciences (SPSS) Version 13.0 for Windows was used for data analysis (SPSS, Inc., Chicago, IL). Appropriate descriptive statistics and a five block hierarchical regression, using SPSS, were used to determine which of the factors (demographics, education, professional development, beliefs, perceived barriers,) were associated with the dependent variable. The dependent variable was the mean number of times the dentists reported engaging in the nine intervention strategies.

## CHAPTER 4

### RESULTS

#### **ARTICLE 1: Development of Dental Care Intervention Strategies for Eating Disorders.**

##### **Abstract**

**Objective:** The purpose of the study was to explore what experts in eating disorders and dental interventions believe the roles and responsibilities of dentists should be in intervening with patients suspected of an eating disorder.

**Method:** This study consisted of a sample of 30 experts and utilized a two round Delphi survey. For Round 1, intervention strategies that dentists could do with patients suspected of an eating disorder were identified from an exhaustive literature search. Participants were asked to rate the strategies based on those they believed were most important. In Round 2, this list was revised to include only the strategies the experts believed were most important from Round 1. The survey was sent to the same 30 experts to have them rate the strategies again, based on those they believed were most important.

Frequencies and descriptive statistics were used for Rounds 1 & 2 to identify the most important intervention strategies as perceived by the experts.

**Results:** As a result of the two round Delphi survey, a set of nine intervention strategies were identified as being important for dentists to engage in with patients suspected of eating disorders.

**Conclusion:** A set of intervention strategies for dentists working with suspected eating disorder patients are supported by experts in the field. These strategies create an initial framework for defining the roles and responsibilities

for dentists in intervening with patients suspected of an eating disorder. Guidelines for these strategies, modeled after those used for tobacco should be developed for dentists to use with patients suspected of an eating disorder. These guidelines would provide an essential foundation for dentist training and skill development in early interventions for eating disorders as part of a collaborative team of intervention and treatment specialists.

**Keywords:** Delphi survey, tooth erosion, dental intervention strategies, dental care and eating disorders

### **Introduction**

One in five females in the United States currently struggle from disordered eating, including anorexia and bulimia (Renfrew Center Foundation, 2003). Ninety-five percent of all cases occur among women ages 12-25, with increasing incidence in the 8-11 year old population (Faine, 2003; White & White, 2000; Studen-Pavolvich & Elliott, 2001; Farley, 2002; Renfrew Center Foundation, 2003).

An individual who is diagnosed with *anorexia nervosa* must experience a dissatisfaction and disturbance in perceived body shape and weight and *amenorrhea* or loss of menstruation (American Psychiatric Association, 1994). It is estimated that up to 6% of females are diagnosed with anorexia (Makino, Tsuboi & Dennerstein, 2004).

For *bulimia nervosa* an individual experiences frequent episodes of uncontrolled binge eating followed by compensatory behaviors to prevent weight gain such as vomiting, laxative and diuretic abuse (American

Psychiatric Association, 1994). It is estimated that up to 7% of females suffer from bulimia (Makino, Tsuboi & Dennerstein, 2004).

There are many physical and psychological symptoms that are characteristic signs of anorexia or bulimia; however, these usually occur when the eating disorder has progressed to more serious stages (White & White, 2000). Tooth erosion is one symptom that occurs in the early stages of the eating disorder; in fact, this early visible sign often occurs during the first six months of an eating disorder (Faine, 2003; Altshuler, Dechow, Waller & Hardy, 1990; Rytomaa, Jarvinene, Kanerva & Heinonen, 1998).

Tooth erosion can be a result of starvation associated with anorexia or excessive vomiting associated with bulimia. Since tooth erosion can be the first distinguishable sign of an eating disorder; one important role of the dentist should be early detection, and initiation of an appropriate intervention (De Moor, 2004; Faine, 2003; Schmidt & Treasure, 1997). This is especially true since a large majority of adolescents regularly visit the dentist. Results of the National Youth Tobacco Survey indicated that 71% of youth ages 11-18 visited the dentist within the past twelve months (Shelley et al, 2005).

Other clinicians, especially primary care physicians, often are not aware of patients with eating disorders because of a lack of visible symptoms until the disease has progressed (Maradiegue, Cecelic, Bozzelli & Frances, 1996; Bursten, Gabel, Brose & Monk, 1996; Karwautz, Wober-Bingol, Wober & Friedrich, 1997; Sayag & Latzer, 2002). Even in the severe stages of eating disorders, particularly bulimia, there may be a lack of detectable signs that a

physician can detect because the majority of individuals with bulimia maintain normal lab results and a normal body weight (Sayag & Latzer, 2002; Bursten, Gabel, Brose & Monk, 1996). Consequently, approximately 50% of eating disorder cases go undetected by physicians (Marks, Beumont, & Birmingham, 2003; Karwautz, Wober-Bingol, Wober & Friedrich, 1997). This further supports the fact that the dentist should be the clinician to detect eating disorders, especially in the early stages.

The literature identifies several potential roles and responsibilities for dentists working with suspected eating disordered patients. These responsibilities include working as part of a multidisciplinary team and referring the patient to other health professionals. (Bouqout & Seime, 1997; Burke, Ismail, & Hartley, 1996; Woodmansey, 2000; Gurenlian, 2002; Hazelton & Faine 1996). The literature also recognizes the dentist's responsibility to provide ongoing management and treatment of oral symptoms associated with anorexia and bulimia through follow-up visits. This includes emergency care, patient education, pre restorative care, restorative care and maintenance (Burke, Ismail, & Hartley, 1996). Dental care should initially be focused on reducing the destruction of the oral tissues (Roberts & Tylenda, 1989). This includes advising the patient to rinse with a sodium bicarbonate solution to neutralize the acids in the mouth and discouraging the patient from brushing immediately after a vomiting episode to prevent additional damage to the teeth (Gross, Brough, & Randolph, 1986; Gurenlian, 2002; Studen-Pavolich & Elliott, 2001). After the patient has received adequate treatment

and stopped the eating disorder behaviors, reconstructive treatment can be done to repair the damage from the eating disorder (Hazelton & Faine, 1996).

Although the literature identifies several potential roles for dentists in intervening with eating disordered patients, there are no standard guidelines for intervention strategies that would serve to assist as they encounter patients suspected of eating disorders in their clinical practice.

One area that does have a set of standard intervention guidelines for dentists is tobacco use. Like eating disorders, tobacco can result in significant oral damage with an increased risk of oral cancer and periodontitis or inflammation of the gums. Due to the extensive damage that can occur, it is important for the dentist to intervene with the patient (Tomar, 2001). The United States Public Health Service has specific recommendations for brief and effective tobacco interventions known as the 5 A's (Havlicek, Stafne & Pronk, 2006; Yip, Hay, Ostroff, Stewart & Cruz, 2000; Fiore, 2000). The 5 A's, which consist of **A**sk, **A**dvice, **A**ssess, **A**ssist and **A**rrange, are considered the standard in tobacco cessation interventions for all clinicians (Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997; Warnakulasuriya, 2002; Barker & Williams, 1999; Shelley et al, 2005; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1999; Fiore, 2000; Tomar, 2001; Albert, Ward, Ahluwalia, & Sadowsky, 2002; Yip, Hay, Ostroff, Stewart & Cruz, 2000).

Numerous studies have demonstrated the importance of clinicians *asking* patients about their smoking behaviors, *advising* them about the harmful effects of smoking, *assessing* the patient's willingness to quit, *assisting*

patients in becoming more aware of potential resources to stop smoking and arranging follow-up contacts to prevent relapse (Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997; Warnakulasuriya, 2002; Barker & Williams, 1999; Shelley et al, 2005; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1997; Fiore, 2000; Tomar, 2001; Albert, Ward, Ahluwalia, & Sadowsky, 2002; Yip, Hay, Ostroff, Stewart & Cruz, 2000). The 5A's are widely used by clinicians and there has been significant physician compliance specifically with the first two A's, Ask and Advise (Quinn et al, 2005). The use of the 5A's in the clinical setting has been associated with higher quit rates among patients that smoke (Fiore, 2000; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1997; Warnakulasuriya, 2002, Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997).

There has been extensive effort to increase the use of 5A's in the clinical setting, especially among dentists, and several dental and medical organizations have endorsed the 5A's for tobacco intervention (Shelley et al, 2005). The American Dental Association has strongly encouraged its members to educate their patients on tobacco and to be fully educated on tobacco cessation interventions. Furthermore, curriculums in dental schools have increased the amount of information they provide on tobacco cessation (Stafne & Bakdash, 2004).

Since the 5A's have been widely endorsed as the standard for tobacco intervention, similar actions should be taken to assist dentists with other oral health issues that also cause significant dental damage. Anorexia and bulimia,



in particular, are health issues that require early detection and intervention in order to significantly increase the chances for a favorable outcome and decrease oral damage (Brown & Bonifazi, 1993; Marks, Beumont, & Birmingham, 2003). A set of 5A-like intervention strategies could provide clarification of the roles and responsibilities for dentists in intervening with patients suspected of eating disorders. Despite the fact that dentists can be the first clinicians to recognize eating disorders, little is known about whether or not there is widespread support for a 5A-like intervention protocol for dentists whose patients have suspected eating disorders (Silber & Wynne, 1999; DiGiacchino, Keenan & Sargent; 2000).

The purpose of this study was to determine what roles and responsibilities professionals believe dentists should have when intervening with patients who are suspected of an eating disorder. The specific research question that was answered in this study was: What are potential strategies that experts agree would form a 5A-like intervention for dentists to utilize when intervening with patients suspected of an eating disorder?

## **Methods**

### **Participants**

Participants consisted of experts in the fields of dentistry interventions and eating disorders and were selected based on one of two criteria: 1) those who were published in either dental interventions or eating disorder research and 2) those who were active in the eating disorder field through private practice and membership in professional organizations. Business phone numbers, email

addresses, and mailing addresses were obtained for experts by accessing their business websites and obtaining publicly available information.

After approval from the Institutional Review Board (IRB), the experts were contacted by either phone or email and asked to participate. A standard script was used to ask the experts to participate in the study. A total of 30 experts agreed to participate. Seven of the experts were identified in the area of dental interventions, 13 experts were identified in the area of eating disorder research and 10 experts were identified based on their activity and private practice involvement in the area of eating disorders.

### **Survey Development**

#### **Dental Care and Eating Disorders Delphi Survey: Round 1**

To assess contemporary dental interventions for sensitive health topics such as tobacco use or eating disorders, an exhaustive search of the literature was conducted. In this search all potential intervention strategies/practices were compiled and unique similarities/differences were assessed. The researcher found a total of 14 practices/strategies that were discussed most frequently in the literature and developed a one page survey focused on these strategies; the *Dental Care and Eating Disorders Delphi Survey* (see Table 4.1).

**Table 4.1 Delphi Survey for Round 1**

Description of Practice	Not Important	Somewhat Important	Extremely Important
1. Ask the patient suspected of having an eating disorder about their abnormal eating patterns using a non judgmental approach	1	2	3
2. Ask questions regarding disordered eating on a written health history form that all patients must answer and update with each visit	1	2	3
3. Recognize the stage and severity of the dental symptoms associated with an eating disorder	1	2	3
4. Provide the patient with education regarding dental complications associated with abnormal eating patterns	1	2	3
5. Provide the patient with nutritional education regarding complications associated with abnormal eating patterns	1	2	3
6. Provide the patient with education regarding medical and psychological complications associated with abnormal eating	1	2	3
7. Provide advice regarding minimizing damage to the teeth such as using mouthwash, brushing, etc.	1	2	3
8. Maintain regular communication with other professionals to Work as a multidisciplinary team	1	2	3
9. Manage and continue to treat the patient providing basic care	1	2	3
10. Explain to the patient that no restorative work will be done until recovery from the eating disorder is established	1	2	3
11. Provide names and referrals to physicians	1	2	3
12. Provide referrals to a dietician or nutritionist	1	2	3
13. Provide referrals to a psychologist, psychiatrist or therapist	1	2	3
14. Provide some type of training for the staff, including dental assistants and dental hygienists	1	2	3
15. Other (please describe) _____	1	2	3

### **Dental Care and Eating Disorders Delphi Survey: Round 2**

The Round 1 responses were compiled and reworded based on expert input and the most important expert strategies identified were selected for inclusion in Round 2. For the revised Round 2 survey, the experts were asked to rate potential intervention strategies as to their relative importance. Based on experts' comments, two questions were included to gather additional information on the role and responsibilities of the dentist. One question specifically asked the experts to identify the clinician they believed should be the one to intervene with a patient suspected of an eating disorder. This was asked to clearly establish a consensus among the experts as to whose role it is to engage in the intervention strategies with the patient suspected of an eating disorder. The other question solicited information on which health professional the patient should be referred to for treatment (see Table 4.2).

**Table 4.2 Delphi Survey for Round 2**

	Not Important	Somewhat Important	Neutral	Important	Very Important
1. Recognize and assess various dental symptoms associated with an eating disorder	0	1	2	3	4
2. Ask the patient suspected of having an eating disorder about their eating patterns using a non-judgmental and subtle approach	0	1	2	3	4
3. Assist the patient suspected of having an eating disorder by providing information regarding dental consequences associated with abnormal eating patterns	0	1	2	3	4
4. Advise the patient suspected of having an eating disorder about minimizing damage to the teeth such as using mouthwash, brushing, etc.	0	1	2	3	4
5. Provide referrals to:					
a. physician	0	1	2	3	4
b. dietitian/nutritionist	0	1	2	3	4
c. therapist/psychologist/psychiatrist	0	1	2	3	4
d. other _____					
6. Be involved as part of a multidisciplinary team focused on patient care for eating disorders	0	1	2	3	4
7. Arrange future follow-up dental visits with the patient suspected of having an eating disorder	0	1	2	3	4
8. Provide training for dental staff on how to communicate with patients suspected of an eating disorder	0	1	2	3	4
9. Assist the patient suspected of having an eating disorder by providing additional resources in the form of:					
a. websites	0	1	2	3	4
b. pamphlets	0	1	2	3	4
c. brochures	0	1	2	3	4
d. Other _____					
10. Other (not listed previously)	0	1	2	3	4
11. Which professional should be the first person the dentist should refer the patient to when he/she encounters a patient in the early stages of an eating disorder?					
a. physician					
b. dietitian/nutritionist					
c. therapist/psychologist/psychiatrist					
d. other _____					
12. When a patient is first identified as having a potential eating disorder, which dental practitioner do you think should have the primary responsibility for communicating with these patients?					
a. dentist					
b. dental hygienist					
c. dental assistant					

## **Procedure and Analysis**

### **Round 1**

The *Dental Care and Eating Disorders Delphi Survey* was mailed to each expert along with a letter describing the purpose of the research, instructions for completing the survey, an informed consent form, a self-addressed stamped envelope and contact information for the researcher. For Round 1, the experts rated the listed strategies based on those they believed were the most important for dentists to perform whenever they suspect an eating disorder and they were asked to add any additional strategies that they believed to be important. The experts completed the survey, and returned it in the self addressed, stamped envelope that was provided. Reminders were sent approximately one and two weeks after the initial mailing. The Statistical Package for the Social Sciences (SPSS) Version 13.0 for Windows was used to calculate frequencies for the data (SPSS, Inc., Chicago, IL). The frequencies for each strategy were examined to identify the percentage of experts that rated each strategy as “not important” “somewhat important” and “extremely important.” The strategies with the lowest overall percentage of importance and negative comments from the experts were removed. The researcher created another survey based on the strategies that were identified as most important from Round 1 by examining the frequencies for each response and comments from the experts.

### **Round 2**

Round 2 involved sending the revised survey to the same 30 experts. The experts returned the survey in the self-addressed stamped envelope and a

reminder email was sent one and two weeks after initial mailing. The frequencies for each item were examined to identify those with high and low percentages of importance. Comments from the experts were also examined to determine the most important intervention strategies as perceived by the experts.

## **Results**

### **Round 1**

A total of 23 experts out of the 30 completed the survey for a response rate of 76 %. Eight experts were therapists in private practice, nine were researchers in eating disorders and six experts were in dental care interventions. The strategy with the lowest overall percentage of importance (39%, N=9) was delaying restorative work (#10). This strategy also received negative comments from experts, including one comment that referred to the strategy as “a bad idea.” Strategy #2, providing written questions about eating disorders, also received several negative comments from the experts, and therefore it was also removed. Two other strategies, #5 & 6, providing nutritional, medical and psychological information, were removed as experts did not believe that these should be part of the dentists’ responsibilities. The remaining strategies received high percentages of importance and were reworded for the survey in Round 2. Strategy #7, provide advice to minimize oral damage, was rated as extremely important by 100% of the experts. Over 87% of the experts rated the following strategies as extremely important: recognizing the stage and severity of an eating disorder, asking the patient

about abnormal eating patterns, managing and continuing to treat the patient, providing education on oral complications, providing referrals to physicians and psychologists. Working as part of a multidisciplinary team and providing staff training were also recognized as important through positive feedback from the experts. Two strategies: provide additional resources for the patient such as websites, brochures, etc. and provide frequent follow-up visits, were written in by dentists and added to the survey. These responses from the experts supported the literature by rating the majority of the strategies as extremely important. As a result, a total of nine strategies were retained from Round 1 (see Table 4.3).

**Table 4.3 Results of the Delphi Survey for Round 1**

Description of Practice	Not Important N/(%)	Somewhat Important N/(%)	Extremely Important N/(%)
1. Ask the patient suspected of having an eating disorder about their abnormal eating patterns using a non judgmental approach	1 (4.3%)	2 (8.7%)	20 <b>(87.0%)</b>
2. Ask questions regarding disordered eating on a written health history form that all patients must answer and update with each visit	4 (17.4%)	4 (17.4%)	15 (65.2%)
3. Recognize the stage and severity of the dental symptoms associated with an eating disorder	0 (0.0%)	2 (8.7%)	21 <b>(91.3%)</b>
4. Provide the patient with education regarding dental complications associated with abnormal eating patterns	0 (0.0%)	3 (13.0%)	20 <b>(87.0%)</b>
5. Provide the patient with nutritional education regarding complications associated with abnormal eating patterns	8 (34.8%)	10 (43.5%)	5 (21.7%)
6. Provide the patient with education regarding medical and psychological complications associated with abnormal eating	3 (13.0%)	16 (69.6%)	4 (17.4%)
7. Provide advice regarding minimizing damage to the teeth such as using mouthwash, brushing, etc.	0 (0.0%)	0 (0.0%)	23 <b>(100%)</b>



8. Maintain regular communication with other professionals to work as a multidisciplinary team	1 (4.3%)	6 (26.1%)	16 (69.6%)
9. Manage and continue to treat the patient providing basic care	0 (0.0%)	1 (4.3%)	22 <b>(95.7%)</b>
10. Explain to the patient that no restorative work will be done until recovery from the eating disorder is established	9 (39.1%)	10 (43.5%)	4 (17.4%)
11. Provide names and referrals to physicians	0 (0.0%)	3 (13.0%)	20 <b>(87.0%)</b>
12. Provide referrals to a dietician or nutritionist	2 (8.7%)	7 (30.4%)	14 (60.9%)
13. Provide referrals to a psychologist, psychiatrist or therapist	0 (0.0%)	3 (13.0%)	23 <b>(87.0%)</b>
14. Provide some type of training for the staff, including dental assistants and dental hygienists	0 (0.0%)	4 (17.4%)	19 <b>(82.6%)</b>
15. Other: Schedule frequent follow-ups with the patient Provide additional resources such as websites, brochures, etc.			

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Note. N= 23.

## Round 2

The majority of the experts rated the strategies as either important or very important. Over 80% of the experts rated seven of the nine strategies as either important or very important. Over half of the experts rated strategy #6, on the multidisciplinary approach, as important or very important and it also received positive comments, such as “Important for dentist to be involved in”. Strategy #9, on providing resources, was combined into one main strategy based on experts’ comments. The other change that was made was to strategy #5, about the dentist referring the patient to other professionals. Some experts commented on the fact that a dietitian is important but it is not the responsibility of the dentist to provide a referral to this professional. As a result, the dietitian subpart to strategy #5 was removed and the other two

subparts, physician and therapist referrals, were retained. A total of 16 experts out of the original 30 sent back the survey for a response rate of 53%. Seven were researchers in eating disorders, six were therapists in private practice and three were in dental care interventions. Nine strategies were identified by the experts as the most important strategies that a dentist should do with patients suspected of an eating disorder. Seven of the strategies fall into the original 5A's, but with a different order. The remaining two strategies were unique to dental interventions and formed a separate category which was named "Other." These nine strategies collectively serve as a preliminary set of 5A-like intervention strategies that the experts identified as important for a dentist to carry out with a patient suspected of an eating disorder (see Tables 4.4 & 4.5).

**Table 4.4 Results of the Delphi Survey for Round 2**

	Not Important N/(%)	Somewhat Important N/(%)	Neutral N/(%)	Important N/(%)	Very Important N/(%)
1. Recognize and assess various dental symptoms associated with an eating disorder	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (6.3%)	15 (93.8%)
2. Ask the patient suspected of having an eating disorder about their eating patterns using a non-judgmental and subtle approach	1 (6.3%)	0 (0.0%)	0 (0.0%)	6 (37.5%)	9 (56.3%)
3. Assist the patient suspected of having an eating disorder by providing information regarding dental consequences associated with abnormal eating patterns	0 (0.0%)	1 (6.3%)	1 (6.3%)	4 (25.0%)	10 (62.5%)
4. Advise the patient suspected of having an eating disorder about minimizing damage to the teeth such as using mouthwash, brushing, etc.	0 (0.0%)	1 (6.3%)	1 (6.3%)	4 (25.0%)	10 (62.5%)

5. Provide referrals to:					
a. physician	0 (0.0%)	0 (0.0%)	1 (6.3%)	6 <b>(37.5%)</b>	9 <b>(56.3%)</b>
b. dietitian/nutritionist	2 (12.5%)	1 (6.3%)	2 (12.5%)	6 (37.5%)	5 (31.3%)
c. therapist/psychologist/psychiatrist	0 (0.0%)	0 (0.0%)	1 (6.3%)	3 <b>(18.8%)</b>	12 <b>(75.0%)</b>
6. Be involved as part of a multidisciplinary team focused on patient care for eating disorders	3 (18.8%)	1 (6.3%)	3 (18.8%)	5 <b>(31.3%)</b>	4 <b>(25.0%)</b>
7. Arrange future follow-up dental visits with the patient suspected of having an eating disorder	0 (0.0%)	2 (12.5%)	1 (6.3%)	8 <b>(50.0%)</b>	5 <b>(31.3%)</b>
8. Provide training for dental staff on how to communicate with patients suspected of an eating disorder	0 (0.0%)	1 (6.3%)	2 (12.5%)	4 <b>(25.0%)</b>	9 <b>(56.3%)</b>
9. Assist the patient suspected of having an eating disorder by providing additional resources in the form of:					
a. websites	1 (6.3%)	4 (25.0%)	4 (25.0%)	5 (31.3%)	2 (12.5%)
b. pamphlets	0 (0.0%)	5 (31.3%)	2 (12.5%)	6 (37.5%)	3 (18.8%)
c. brochures	0 (0.0%)	5 (31.3%)	2 (12.5%)	7 (43.8%)	2 (12.5%)
12. Which professional should be the first person the dentist should refer the patient to when he/she encounters a patient in the early stages of an eating disorder?					
a. physician				5	5 (31.3%)
b. dietitian/nutritionist				2	2 (12.5%)
c. therapist/psychologist/psychiatrist				8	8 (50.0%)
d. other				1	1 (6.3%)
13. When a patient is first identified as having a potential eating disorder, which dental practitioner do you think should have the primary responsibility for communicating with these patients?					
a. dentist				16	16 (100%)

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Note. N=16.

**Table 4.5 Set of 5A-Like Intervention Strategies**

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**ASSESS:**

1. Recognize and assess various dental symptoms associated with an eating disorder

**ASK:**

2. Ask the patient suspected of having an eating disorder about their eating patterns using a non-judgmental and subtle approach

**ADVISE:**

3. Advise the patient suspected of having an eating disorder about minimizing damage to the teeth such as using mouth wash, brushing, etc.

**ASSIST:**

4. Assist the patient suspected of having an eating disorder by providing information regarding dental consequences associated with abnormal eating patterns

5. Assist the patient suspected of having an eating disorder by providing additional resources in the form of: websites, pamphlets, brochures, etc

**ARRANGE:**

6. Arrange future follow-up dental visits with the patient suspected of having an eating disorder

7. Provide referrals to:

- a. physician
- b. therapist/psychologist/psychiatrist

**OTHER:**

8. Participate as part of a multidisciplinary team focused on patient care for eating disorders

9. Provide training for dental staff on how to communicate with patients suspected of an eating disorder

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## Conclusion

The results from the two round Delphi indicated that the experts unanimously agreed that the dentist's role includes intervening with patients suspected of an eating disorder. The literature supports this result and identifies the dentist as the clinician most likely to detect an eating disorder in the early stages (De Moor, 2004; Faine, 2003; Schmidt & Treasure, 1997). This finding further defines the role of the dentist with patients suspected of eating disorder as perceived by the experts in the field.

Results also identify a consensus among the experts on nine intervention strategies that dentists should do with patients suspected of an eating disorder. These nine strategies followed the framework of the 5A's used in tobacco and seven of the strategies from this study formed the original five categories of Assess, Ask, Assist, Advise and Arrange. The expert identified 5A-like intervention strategies for eating disorders are: **A**ssess various dental symptoms with the eating disorder, **A**sk the patient suspected of having an eating disorder about their eating patterns using a non-judgmental and subtle approach, **A**dvice the patient suspected of having an eating disorder about minimizing damage to the teeth such as using mouth wash, etc, **A**ssist the patient suspected of having an eating disorder by providing information on dental consequences associated with abnormal eating patterns and assist the patients suspected of having an eating disorder by providing additional resources, **A**rrange future follow-up dental visits and arrange referrals with other health professionals. The experts also identified two additional strategies

that they believe is important for a dentist to do when intervening with a patient suspected of an eating disorder. These strategies formed a sixth category entitled “Other” that includes: participate as part of a multidisciplinary team and provide training for all dental staff.

Importantly, the majority of experts identified these nine 5A-like strategies as key responsibilities of the dentist in early intervention for eating disorders. As a result, the dentist’s responsibilities have been more clearly defined with the development of these potential 5A-like intervention strategies. This was particularly significant since there are currently no guidelines or strategies for dentists to use with patients suspected of an eating disorder.

By performing the strategies, dentists would have the responsibilities of referring patients to other health professionals, assessing the dental symptoms, advising patients on minimizing tooth damage, assisting the patient by providing information on dental consequences and providing follow-up visits to manage and treat the oral symptoms associated with anorexia and bulimia. These responsibilities have been previously identified in the literature as important for the dentist to do, and the findings in this study show that over 80% of the experts also believe they are important (Bouqout & Seime, 1997; Burke, Ismail, & Hartley, 1996; Woodmansey, 2000; Gurenlian, 2002; Hazelton & Faine 1996).

There were some limitations for this study. First, the results of the survey are based on the participants’ accuracy and honesty in filling out the survey. Second, the response was limited to the voluntary action of the participants in

filling out the survey and mailing it back with a provided self-addressed stamped envelope.

Further research is needed in establishing guidelines similar to the 5A-like intervention strategies developed in this study for dental care and eating disorders. This research serves as a starting point to developing such guidelines which could prove to be as effective as the 5A's for tobacco interventions.

## **ARTICLE 2: The Nature and Extent of Dental Care Interventions for Eating Disorders in Oregon**

### **Abstract**

**Objective:** The purpose of this study was to identify what dentists in Oregon are currently doing when they suspect a patient has an eating disorder.

**Method:** A set of potential intervention strategies that experts believe dentists should engage in with patients suspected of eating disorders was developed by the researcher prior to this study. These strategies were incorporated into a survey, *The Eating Disorders and Dental Care Survey*, which was mailed to a stratified, proportional, random sample of 763 dentists from four regions in the state of Oregon. Descriptive and univariate statistics and frequencies were run to identify demographics, factors about the dentists' education/training related to eating disorders, beliefs about the importance in intervening with patients suspected of an eating disorder, perceived barriers, and current intervention strategies.

**Results:** Results indicated that 97% of the dentists believed it is important for them to intervene early with a patient suspected of an eating disorder, however, the majority were not using the intervention strategies on a regular basis. Importantly, they reported receiving little or no education on eating disorders in dental school and indicated a lack of confidence in their ability to successfully engage in 5A-like intervention strategies modeled after those for tobacco use.

**Conclusion:** Recommended intervention strategies for dentists who suspect patients of eating disorders could serve as a starting point in developing guidelines similar to the 5A's in tobacco control by defining the roles and



responsibilities of dentists in intervening with patients in the earliest stages of an eating disorder. The guidelines would also provide dentists with a direction for training and skill development, reduce perceived barriers and set the stage for greater dentist collaboration as part of a multidisciplinary team when working with patients suspected of an eating disorder.

**Keywords:** intervention strategies, dentists, eating disorders, perceived barriers.

### **Introduction**

An estimated ten million women in the United States suffer from an eating disorder such as anorexia or bulimia (National Eating Disorder Association, 2005). Young women, in particular, appear to be at high risk for development of these diseases, with approximately one million new cases each year (White & White, 2000). Ninety-five percent of these cases are among women ages 12-25, with increasing incidence in the 8-11 year old population. (Faine, 2003; White & White, 2000; Studen-Pavolvich & Elliott, 2001; Renfrew Center Foundation, 2003).

*Anorexia nervosa* is defined as a refusal to maintain normal body weight and a fear of gaining weight. To establish a diagnosis of anorexia, an individual must also experience a dissatisfaction and disturbance in perceived body shape and weight and *amenorrhea* or loss of menstruation (American Psychiatric Association, 1994). It is estimated that up to 6% of females are diagnosed with anorexia (Makino, Tsuboi & Dennerstein, 2004).

*Bulimia nervosa* is characterized as frequent episodes of uncontrolled binge eating followed by compensatory behaviors to prevent weight gain such as vomiting, laxative and diuretic abuse (American Psychiatric Association, 1994). It is estimated that up to 7% females suffer from bulimia (Makino, Tsuboi & Dennerstein, 2004). Although each of these eating disorders exacts a tremendous toll in physical and psychological suffering, the long term consequences, including disability and death, provide testimony to the seriousness of these disorders.

There are many physical and psychological symptoms that are characteristic signs of anorexia or bulimia, but they usually occur when the eating disorder has progressed to more serious stages (White & White, 2000). However, tooth erosion is one symptom that occurs in the early stages of the eating disorder; in fact this early visible sign may occur during the first six months of either anorexia or bulimia (Faine, 2003; Altshuler, Dechow, Waller & Hardy, 1990; Rytomaa, Jarvinene, Kanerva & Heinonen, 1998).

Dental erosion is a result of starvation associated with anorexia and excessive vomiting associated with bulimia. Chronic regurgitation causes the hydrochloric acid from the stomach to break down the enamel and the dentin of the teeth which results in perimolysis or erosion and demineralization of the tooth enamel (Gurenlian, 2002; Faine, 2003). Tooth erosion can also be attributed to excessive consumption of acidic foods and beverages such as citrus fruits and diet soda, which are staples in the diet of individuals with an eating disorder (Phillip, Willershausen-Zonnchen, Hamm & Pirke, 1991;

Faine, 2003; American Dietetic Association, 2003). Other oral symptoms include dental caries, enlarged parotid gland, dentin hypersensitivity, dry mouth, periodontal disease and soft tissue lesions as a result of excessive vomiting and gastric acids in the mouth (Rytomaa, Jarvinene, Kanerva & Heinonen, 1998; Hazelton & Faine, 1996; De Moor, 2004; Faine, 2003).

Since dental erosion can be the first visible sign of an eating disorder; dentists have a unique “window of opportunity” to be the clinicians to detect eating disorders (De Moor, 2004; Faine, 2003; Schmidt & Treasure, 1997). This is especially true since a large majority of adolescents regularly visit the dentist. Results of the National Youth Tobacco Survey indicated that 71% of youth ages 11-18 visited the dentist within the past twelve months (Shelley et al, 2005).

Other clinicians, especially primary care physicians, often are not aware of patients with eating disorders because of a lack of visible symptoms until the disease has progressed (Maradiegue, Cecelic, Bozzelli & Frances, 1996; Bursten, Gabel, Brose & Monk, 1996; Karwautz, Wober-Bingol, Wober & Friedrich, 1997; Sayag & Latzer, 2002). This further illustrates the potential for dentists to be the clinicians to detect eating disorders. However, little is known about how the nature and extent of dental interventions.

One area where there has been research on dental interventions is in the area of dental health and tobacco use. Tobacco use can result in significant oral damage with an increased risk of oral cancer and periodontitis or inflammation of the gums. Tobacco use, like eating disorders, is a sensitive

issue that requires sophisticated skills and specific knowledge about patient/clinician interactions to maximize effectiveness (Tomar, 2001). To provide guidance for clinicians including dentists, The United States Public Health Service has specific recommendations for brief and effective tobacco interventions known as the 5A's (Havlicek, Stafne, & Pronk, 2006; Yip, Hay, Ostroff, Stewart & Cruz, 2000; Fiore, 2000). The 5A's, which consist of Ask, Advise, Assess, Assist and Arrange, provide dentists with brief and standard strategies regarding clinical tobacco interventions with patients (Havlicek, Stafne & Pronk, 2006; Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997; Warnakulasuriya, 2002; Barker & Williams, 1999; Shelley et al, 2005; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1999; Fiore, 2000; Tomar, 2001; Albert, Ward, Ahluwalia, & Sadowsky, 2002; Yip, Hay, Ostroff, Stewart & Cruz, 2000).

Research has demonstrated the importance of clinicians *asking* patients about their smoking behaviors, *advising* them about the harmful effects of smoking, *assessing* the patient's willingness to quit, *assisting* patients in becoming more aware of potential resources to stop smoking and *arranging* follow-up contacts to prevent relapse (Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997; Warnakulasuriya, 2002; Barker & Williams, 1999; Shelley et al, 2005; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1997; Fiore, 2000; Tomar, 2001; Albert, Ward, Ahluwalia, & Sadowsky, 2002; Yip, Hay, Ostroff, Stewart & Cruz, 2000). The 5A's are widely used among clinicians and are considered the standard for tobacco interventions (Havlicek, Stafne, &

Pronk, 2006). The 5A's have been shown to increase quit rates by as much as 30% among patients that smoke (Shelley et al, 2005; Fiore, 2000; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1997; Warnakulasuriya, 2002, Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997).

Physicians report using the 5A's more frequently than dentists, and as a result there has been an increased effort to encourage dentists to use the 5A's because of the extensive oral damage from tobacco use (Havlicek, Stafne, & Pronk, 2006; Quinn et al, 2005). Some United States dental schools have increased the amount of information and training they provide on tobacco interventions. The University of Minnesota School of Dentistry serves as one example of a dental school that provides a comprehensive program on tobacco intervention and prevention. Within the program, all dental students are required to practice the 5A's with patients in the dental clinics. The dental students are then required to discuss one of these interventions with the program director (Stafne & Bakdash, 2004). Additional support is provided for clinician use of a 5A standard for tobacco interventions by the endorsement of several medical and dental organizations (Shelley et al, 2005). For example, American Dental Association supports tobacco intervention and encourages its members to be educated on tobacco interventions and to educate their patients on tobacco use (Havlicek, Stafne & Nicolaas, 2006).

Since there has been an emphasis on the importance of the 5A's and the use of this intervention in tobacco, a set of 5A-like intervention strategies could be created to encourage dentists to intervene with other oral health issues

that involve behavior change. Anorexia and bulimia, in particular, are health issues that require early detection and intervention in order to significantly increase the chances for a favorable outcome (Brown & Bonifazi, 1993; Marks, Beumont, & Birmingham, 2003). A set of 5A-like intervention strategies would provide dentists with the tools necessary for early, successful eating disorder interventions in much the same way as the 5A's have been helpful in changing smoking behaviors in the clinical setting. Although dentists can be the first clinicians to recognize eating disorders, little is known about the actions that dentists take when they suspect an eating disorder (Silber & Wynne, 1999).

The purpose of this study was to identify what dentists in Oregon are currently doing when they suspect a patient of having an eating disorder. A set of potential intervention strategies that experts believe dentists should engage in with patients suspected of eating disorders was developed by the researcher through a 2 round Delphi survey. These strategies served to answer the research question: What is the nature and extent of current intervention strategies for eating disorders by dentists?

## **Method**

### **Participants**

This study was conducted with a stratified, proportional random sample of Oregon dentists (N=387). Sample selection consisted of obtaining a CD ROM containing a list of all licensed Oregon dentists through the Oregon Board of Dentistry. The CD ROM contained a current listing of 2543 Oregon dentists

holding a DDS or DMD degree as of January 2005. Mailing addresses for each dentist were also provided. From this list, dentists were grouped together based on their geographic region within the state of Oregon according to the Oregon Department of Transportation. The Oregon Department of Transportation geographically divides the state of Oregon into five regions, which are assigned a number from 1 to 5. To insure a representative sample, stratified proportional random sampling was the method of selection used in this study (Portney and Watkins, 2000). Regions 4 and 5 were low in population of dentists, so they were combined.

The power analysis for this study was calculated with the program Power and Precision Version 2 (Biostat, 2000). Using a medium effect size of .15 and a power of .90, a minimum of 130 participants total was required for the study (Biostat, 2000, Cohen, 1992). To insure an adequate response rate and to account for a representative sample, 30% of each region was selected for a total sample size of 763 (Salant & Dillman, 1994) (see Table 4.6). The dentists were randomly selected from each region using the random number generator, Research Randomizer, to identify the sample for that region (Urbaniak & Plous, 2006).

**Table 4.6 Sample Selection of Oregon Dentists**

Region	# of Dentists	Percentage Of Population	30% of Region
Region 1	1423	56%	427
Region 2	593	23%	178
Region 3	273	11%	82
Region 4 & 5	254	10%	76
Total	2543		763

**Measures****Dental Care and Eating Disorder Survey**

An 18-item survey, the *Dental Care and Eating Disorder Survey*, was developed by the researcher to identify intervention strategies for patients suspected of eating disorders. The first eleven questions were designed to elicit demographic and background information including gender, age, years as a practicing dentist, location of dental office and size and type of dental office. The remaining questions assessed dental education/training about eating disorders, eating disorder related professional development, perceived importance for early intervention by dentist, perceived barriers in working with patients suspected of an eating disorder, and the frequency the dentists performed each of the experts' recommended nine intervention strategies.



## **Procedure and Analysis**

Before the survey was administered, experts consisting of faculty and graduate students in the field of Public Health examined the survey for content and face validity. The survey was then pilot tested with a sample of eight Oregon dentists to establish readability, face and content validity.

The survey, a self-addressed stamped envelope, a letter of informed consent and a cover letter including survey instructions, a description of the research study and contact information for the researcher were sent to each dentist. The surveys were coded to identify those who did not return the surveys (Portney & Watkins, 2000). The completed surveys were sent back to the university mailing service. Approximately 1 week after the initial mailing, a follow-up postcard was sent to those who had not responded reminding them to complete the survey and mail it back to the researcher (Portney and Watkins, 2000). Three weeks after the initial mailing, a second reminder postcard was sent to the dentists who had not responded. Several dentists called the researcher after receiving the reminder cards, requesting another survey to be sent to them.

Descriptive statistics were run for all of the factors for the dentists. The descriptive statistics and frequencies were used to provide the nature and extent of dentists' strategies in intervening with individuals suspected of an eating disorder.

## **Results**

### **Demographics**

Out of a total of 763 surveys that were mailed, 387 were returned for a final response rate of 50%. Results of this study indicated that the majority of the dentists surveyed were male (83.9%, N= 323), from Geographic Region 1 (63.6%, N=246), attended dental school in Oregon (77.8%, N=305) and practiced general dentistry (88.5%, N=340). The mean age of the sample of dentists (N=387) was 49 years old. Results indicated that dentists (N=387) averaged 16 patients per day, had an average of 20 years as licensed dentists, and averaged working in an office with one other dentist and two dental hygienists.

Approximately 15% (N=58) of dentists reported that either they or someone close to them has suffered from an eating disorder. Within a six month period, the majority of dentists (61.8%, N=239) recalled that 1-5% of the patients they treated were suspected of having an eating disorder (see Table 4.7).

**Table 4.7 Demographic Variables of Oregon Dentists Sample**

	N	(%)
Gender (N=385)		
Male	323	(83.9%)
Female	62	(16.1%)
Age (N=384)		
<31	8	(2.1%)
31-40	81	(23.8%)
41-50	95	(24.6%)
51-60	144	(37.5%)
>60	42	(11.9%)
Geographic Region		
1	246	(63.6%)
2	81	(20.9%)
3	28	(7.2%)
4	32	(8.3%)
Type of dentistry practice (N=384)		
General	340	(88.5%)
Other	44	(11.5%)
Years as a licensed dentist(N=386)		
0-10	93	(24.1%)
11-20	65	(16.8%)
21-30	166	(42.9%)
>31	62	(16.1%)
Dentists in the office (N=387)		
0-2	334	(86.3%)
3-5	32	(9.9%)
6-8	5	(1.3%)
>8	10	(2.6%)
Hygienists in the office (N=387)		
0-2	301	(77.8%)
3-5	73	(18.8%)
6-8	3	(0.8%)
>8	10	(2.6%)
Patients treated per day (N=383)		
<10	114	(29.8%)
11-20	219	(57.2%)
>21	50	(13.1%)
Graduation from dental school (N=381)		
<1980	125	(33.2%)
1981-1990	137	(36.1%)
> 1991	117	(30.7%)
Dental School (N=387)		
Oregon	306	(77.8%)
Other	81	(21.2%)
Self, friend/family member with ed (N=386)		
Yes	58	(15.0%)
No	328	(85.0%)
% Patients within past 6 months suspected of an eating disorder (N=387)		
0	148	(38.2%)
1-5	239	(61.8%)

Note. Values are numbers and percentages.

### **Dental Education/Training about Eating Disorders**

The first series of questions after the demographic section asked the dentists how much they believed their dental school education prepared them to perform eating disorder related activities. The majority of dentists (n=387, 56.9%) reported receiving some information on providing oral care for teeth with patients suspected of an eating disorder. However, more than half of the dentists (n= 387, 52.5%) reported receiving little or no information on recognizing risk factors associated with eating disorders.

When asked about receiving information on how to discuss eating disorders with patients who show symptoms, 71.8% (N=278) reported receiving little or no information in dental school. Approximately 81% (N=315) reported receiving little or no information on providing referrals to eating disorder professionals (see Table 4.8). In summary, dentists clearly had received some training or information on care for teeth affected by eating disorders, however, when asked about actual courses taken during formal training there was little or no information provided on performing 5A-like strategies for eating disorders.

**Table 4.8 Dental Education/Training about Eating Disorders**

	Not at All N(%)	Not Very much N/(%)	Somewhat N/(%)	Quite a bit N/(%)	A lot N/(%)
Recognize risk factors associated with eating disorders	80 (20.7%)	123 (31.8%)	99 (25.6%)	71 (18.3%)	14 (3.6%)
Provide oral care for teeth affected by eating disorders	57 (14.7%)	110 (28.4%)	101 (28.1%)	96 (24.8%)	23 (5.9%)
Discuss eating disorders with patients who show symptoms	119 <b>(30.7%)</b>	159 <b>(41.1%)</b>	58 (15.0%)	32 (8.3%)	19 (4.9%)
Provide referrals to eating disorder professionals	182 <b>(47.0%)</b>	133 <b>(34.4%)</b>	52 (13.4%)	14 (3.6%)	6 (1.6%)
Educate patients on the risks of eating disorders	146 (37.7%)	102 (26.4%)	74 (19.1%)	59 (15.2%)	6 (1.6%)

Note. N= 387. Values are numbers and percentages.

### **Eating Disorder Related Professional Development**

Data indicated that the most common means for furthering eating disorder knowledge was through reading journal articles on eating disorders, with 77.2% (N=299) of the dentists reporting having read at least one article. Approximately 39.0% (N=151) reported taking continuing education courses, 26.6% (N=103) attended at least one conference session on eating disorders, and 45% (N=178) received information from the TV/computer (see Table 4.9). Interestingly, 73.4% (N=284) reported not attending a conference, 61.5% (N=236) reported not participating in continuing education courses, and 55.0% (N=213) reported not watching tv programs on eating disorders within the last two years.

**Table 4.9 Eating Disorder Related Professional Development in Last Two Years**

	Number of Activities				
	0 N/(%)	1 N/(%)	2 N/(%)	3 N/(%)	4+ N/(%)
Attended Conference Sessions on eating disorders	284 (73.4%)	31 (8.0%)	36 (9.3%)	35 (9.0%)	1 (0.3%)
Read Journal articles on eating disorders	88 (22.7%)	88 (22.7%)	107 (27.6%)	77 (19.9%)	27 (7.0%)
Participated in continuing education courses on eating disorders	236 (61.5%)	57 (14.7%)	69 (17.8%)	22 (5.7%)	3 (0.8%)
Watched TV programs on eating disorders	213 (55.0%)	59 (15.2%)	49 (12.7%)	42 (10.9%)	24 (6.2%)

Note. N=387

### Perceived Importance of Eating Disorder Interventions

When asked about how important dentists felt it was for them to be involved in early intervention with eating disorders, the majority indicated they thought it was either important or very important. More than 97% (N=376) indicated that it is important for dentists to recognize symptoms of an eating disorder. When asked about how important it is for dentists to talk to patients suspected of an eating disorder about their behaviors, 85.1% (N=329) reported it as important or very important. Approximately 97% (N=375) believed that it is important or very important for dentists to advise patients about health risks. The majority of dentists 83% (N=321) also believed it was important or very important for dentists to play a role in early diagnosis of eating disorders. Approximately 85% (N=331) reported that it

was important for dentists to provide resources for patients suspected of an eating disorder (see Table 4.10).

In summary, these results show that an overwhelming majority of the dentists believe it is important or very important for them to be involved in early intervention strategies with patients suspected of eating disorders. These findings show that dentists believe these 5A-like intervention strategies are important and believe that dentists should be engaging in these strategies.

**Table 4.10 Perceived importance of Intervention Strategies**

	Not Important N/(%)	Somewhat Important N/(%)	Neutral N/(%)	Important N/(%)	Very Important N/(%)
Recognize symptoms of an eating disorder	1 (0.3%)	2 (0.5%)	8 (2.1%)	183 (47.3%)	193 (49.9%)
Talk to patients suspected of an eating disorder about their behaviors	1 (0.3%)	11 (2.8%)	46 (11.9%)	162 (41.9%)	167 (43.2%)
Advise the patient suspected of an eating disorder about the dental risks of their behaviors	2 (0.5%)	1 (0.3%)	9 (2.3%)	142 (36.7%)	233 (60.2%)
Play a role in early diagnosis of eating disorders	1 (0.3%)	27 (7.0%)	38 (9.8%)	156 (40.3%)	165 (42.6%)
Provide resources/referrals for patients suspected of having an eating disorder	3 (0.8%)	8 (2.1%)	45 (11.6%)	165 (42.6%)	166 (42.9%)

Note. Values are numbers and percentages.

### Perceived Barriers

When asked about perceived barriers to communicating with patients suspected of an eating disorder, several barriers were identified. Sixty percent of dentists (N=233) perceived amount of time available to talk to patients as a key barrier. Another 64.6% (N=250) believed that confidentiality or lack of

privacy was a barrier. Approximately 80% (N=309) believed that their confidence being able to help a patient with an eating disorder was a barrier. Over 93% (N=361) of dentists believed that the patient refusing to accept help was a barrier and approximately 77% (N=297) of dentists reported that they believed that a lack of knowledge about the appropriate persons to refer the patient to was a barrier. Seventy percent (N= 271) perceived lack of knowledge about eating disorders to be a barrier and 56.9% (N=220) perceived a concern over driving the patient away was a barrier (see Table 4.11).

**Table 4.11 Dentists' Perceived Barriers**

	Not a problem N/(%)	Rarely a problem N/(%)	Somewhat a problem N/(%)	Quite a problem N/(%)	Major problem N/(%)
Amount of time required to discuss eating disorders	44 (11.4%)	110 (28.4%)	152 (39.3%)	64 (16.5%)	17 (4.4%)
Confidentiality issues, lack of privacy	61 (15.8%)	76 (19.6%)	176 (45.5%)	38 (9.8%)	36 (9.3%)
Confidence in my ability to help patients with eating disorders	26 (6.7%)	52 (13.4%)	198 (51.8%)	90 (23.3%)	21 (5.4%)
Patient refusing to accept help for their eating disorder	9 (2.3%)	16 (4.1%)	132 (34.2%)	157 (40.7%)	72 (18.7%)
Lack of knowledge about who to refer the patient to (names of physicians, therapists, etc)	37 (9.6%)	52 (13.5%)	114 (29.5%)	137 (35.5%)	46 (11.9%)
Lack of adequate knowledge of eating disorders	38 (9.8%)	78 (20.2%)	211 (54.5%)	40 (10.3%)	20 (5.2%)
Worry about driving the patient away	74 (19.1%)	93 (24.0%)	165 (42.6%)	42 (10.9%)	13 (3.4%)

Note. N= 387. Values are numbers and percentages.

### **Practicing 5A-Like Intervention Strategies**

Overall, the majority of dentists reported not engaging in the recommended 5A-like intervention strategies identified by eating disorder and



dental intervention experts on a regular basis. Approximately 70% (N=270) reported rarely or never providing referrals to a physician, 83.6% (N=316) reported rarely or never providing referrals to a therapist. Over 88% (N=342) reported rarely or never participating as part of a multidisciplinary team, 61.2% (N=237) reported rarely or never arranging follow-up dental visits with a patient suspected of an eating disorder, 80.6% (N=312) reported providing training for dental staff, and 85.0% (N= 329) reported assisting the patient suspected of having an eating disorder by providing additional resources. Of the dentists surveyed, 51.5% (N=199) reported rarely or never recognizing and assessing the dental symptoms associated with an eating disorder. Three strategies that were carried out most frequently were asking the patient suspected of having an eating disorder about their eating patterns, talking to the patient about the dental consequences of their eating patterns and advising the patient suspected of an eating disorder about minimizing damage to the teeth (see Table 4.12).

**Table 4.12 Practicing 5A-Like Intervention Strategies**

	Never N/(%)	Rarely N/(%)	Sometimes N/(%)	Often N/(%)
<b>ASSESS:</b>				
1. Recognize and assess various dental symptoms associated with an eating disorder	18 (4.7%)	181 (46.8%)	81 (20.9%)	80 (20.7%)
<b>ASK:</b>				
2. Ask the patient suspected of having an eating disorder about their eating patterns	30 (7.8%)	157 (40.6%)	85 (22.0%)	59 (15.2%)
<b>ADVISE:</b>				
3. Advise the patient suspected of having an eating disorder about minimizing damage to the teeth such as using mouth wash, brushing, etc.	37 (9.6%)	108 (27.9%)	67 (17.3%)	76 (19.6%)
<b>ASSIST:</b>				
4. Assist the patient suspected of having an eating disorder by providing information regarding dental consequences associated with abnormal eating patterns	36 (9.3%)	132 (34.1%)	90 (23.3%)	66 (17.1%)
5. Assist the patient suspected of having an eating disorder by providing additional resources (websites, pamphlets, brochures, etc)	197 (50.9%)	132 (34.1%)	54 (14.0%)	4 (1.0%)
<b>ARRANGE:</b>				
6. Arrange future follow-up dental visits with the patient suspected of having an eating disorder	146 (37.7%)	91 (23.5%)	62 (16.0%)	54 (14.0%)
7. Provide referrals to:				
a. physician	104 (27.2%)	166 (43.5%)	69 (18.1%)	24 (6.3%)
b. therapist/psychologist/psychiatrist	164 (43.4%)	152 (40.2%)	40 (10.6%)	7 (1.9%)
<b>OTHER:</b>				
8. Participate as part of a multidisciplinary team focused on patient care for eating disorders	243 (62.8%)	99 (25.6%)	28 (7.2%)	16 (4.1%)
9. Provide training for dental staff on how to communicate with patients suspected of an eating disorder	235 (60.7%)	77 (19.9%)	62 (16.0%)	12 (3.1%)

Note. N= 387. Values are numbers and percentages.

The mean scores were calculated for the nine intervention strategies for each dentist. The rating for each strategy was summed to give a total mean score for each dentist, with a possible range from 0-36. These scores were divided into categories based on high scores (27-36), moderate (18-26) and low (0-17). The results show that the majority (68.5%, N=265) were in the

low category in terms of engaging in all nine strategies on a regular basis. A total of 24.5% (N=95) were in the moderate category, and only 3.4% (N=14) were in the high category and performed all nine strategies on a regular basis. (See Table 4.13).

**Table 4.13 Frequency Dentists Perform Nine 5A-Like Intervention Strategies**

Frequency Category	N	(%)
Low	265	(68.5%)
Moderate	95	(24.5%)
High	14	(3.4%)

Note. Values are numbers and percentages.

### **Conclusion**

This study addressed the important issues of dentists intervening with patients suspected of eating disorders. The past literature has identified dentists as being in a position to detect eating disorders in the early stages and 97% of the dentists in this study agree that this is an important role for their profession. However, most of the dentists reported that they are not performing the strategies on a regular basis. The findings indicated that out of the three categories describing the frequency of engaging in the strategies, the majority of the dentists (68.5%) were in the low category.

Findings also indicated that the majority of dentists reported receiving little or no education or training on eating disorders in dental school. Approximately 70% of the dentists perceived a lack of knowledge of eating

disorders as a barrier to addressing eating disorders with patients. Other barriers such as lack of which professional to refer the patient to, patient refusing to accept help and lack of confidence in ability were reported by an overwhelming majority of the dentists as major barriers.

In an effort to reduce these perceived barriers, guidelines similar to the 5A's with tobacco could provide support for the dentists. The 5A-like intervention strategies used for this study consisted of: **A**ssess various dental symptoms with the eating disorder, **A**sk the patient suspected of having an eating disorder about their eating patterns using a non-judgmental and subtle approach, **A**dvice the patient about minimizing damage to the teeth such as using mouth wash, etc, **A**ssist the patient by providing information on dental consequences associated with abnormal eating patterns and assist the patients by providing additional resources, **A**rrange future follow-up dental visits and arrange referrals with other health professionals. There were two additional strategies that formed a sixth category entitled "Other" that includes: participate as part of a multidisciplinary team and provide training for all dental staff.

This basic framework for the 5A's could be used to: define the roles and responsibilities of dentists, reduce perceived barriers, provide training/skills for dentists and create more of a collaborative multidisciplinary team of health professionals when intervening with a patient suspected of an eating disorder. These guidelines could increase the chances of early detection and intervention by dentists and significantly increase the chances for a favorable outcome for

the patient suspected of an eating disorder (Brown & Bonifazi, 1993; Marks, Beumont, & Birmingham, 2003).

To increase the likelihood of dentists intervening using the 5A-like intervention, the strategies could be practiced during dental school similar to the University of Minnesota's School of Dentistry's program (Stafne & Bakdash, 2004). Since the dentists in this study perceived a lack of eating disorder knowledge, lack of confidence in abilities and lack of education in dental school, it is important to increase the information dentists receive on these topics in dental school. Through practice of the 5A-like intervention strategies for eating disorders in dental school, dentists would be provided training and skills that would decrease the barriers to intervening with patients suspected of an eating disorder.

There were some limitations for this study. First, the study population for the dentists was limited to a representative sample of Oregon dentists and as such the results cannot be generalized to dentists outside of Oregon. Second, the results of the survey are based on self-report and depended on the participants' accuracy and honesty in filling out the survey. Lastly, the response was limited to the voluntary action of the participants in filling out the survey and mailing it back with a provided self-addressed stamped envelope.

Since early detection and diagnosis is critical for a favorable prognosis, it is important that dentists are adequately prepared to intervene. A set of standard 5A-like intervention strategies that provide dentists with skills to

communicate with patients suspected of an eating disorder could remove perceived barriers and increase the likelihood of dentists intervening and work as part of a multidisciplinary team. Further research is needed to explore implementing more training/education on eating disorders into dental school curriculums. Research is also needed to develop guidelines similar to the 5A intervention for tobacco, incorporating the strategies developed prior to this study to assist dentists when communicating with a patient suspected of an eating disorder. The role of dental staff, specifically dental hygienists should also be explored when considering delivery of the guidelines and communicating with the patient as a multidisciplinary team.

**ARTICLE 3: Predictors of regularly engaging in a set of 5A-like intervention strategies for eating disorders among dentists in Oregon**

**Abstract**

**Objective:** The purpose of this study was to determine which factors, if any, (demographics, education, professional development, beliefs and perceived barriers) predict how often dentists utilize intervention strategies for eating disorders.

**Methods:** Prior to this study the researcher surveyed experts using the Delphi technique to identify a set of potential intervention strategies that experts believe dentists should engage in with patients suspected of an eating disorder. For this study, a survey instrument was developed and mailed to a stratified, proportional, random sample of 763 dentists. The dentists were grouped by four distinct geographic regions within the state of Oregon. A five block hierarchical model assessed potential associations between independent variables and how often the dentists engaged in the intervention strategies. Block composition and order of entry into the hierarchical model were based on findings from the literature on eating disorder interventions as well as from the related field of tobacco use. Blocks were arranged by (1) Demographics, (2) Perceived Barriers, (3) Education/Training, (4) Beliefs, and (5) Professional Development.

**Results:** The results of this study indicate that Perceived Barriers, Education/Training, Beliefs and Professional Development were significantly associated with how often dentists engaged in the intervention strategies.

Perceived barriers was the predictor block that explained the most variance in the dependent variable.

**Conclusion:** Based on findings in this study, it is clear that dentists lack vital skills and knowledge in communicating with patients suspected of an eating disorder. To increase the likelihood of dentists regularly performing intervention strategies similar to those used in tobacco, two key actions are recommended. First, it is important to provide education and clinical training in dental school for students to gain necessary skills and knowledge in communicating with patients suspected of an eating disorder. Secondly, it is important to provide in-service and continuing educational opportunities on eating disorders for dentists after graduation to increase their knowledge and enhance their potential for collaboration as part of a multi-dimensional clinical team. Since dentists are in a role to be the first clinician to detect an eating disorder, it is important to provide dentists with skills and knowledge to feel adequately prepared to carry out interventions with patients suspected of an eating disorder to insure early diagnosis and recovery from these often fatal conditions.

### **Introduction**

In the United States, approximately ten million women suffer from an eating disorder such as anorexia or bulimia and there are an estimated one million new cases each year (National Eating Disorder Association, 2005). Young women, in particular, are at a high risk for development of these disorders and approximately 95% percent of cases are among women ages 12-



25. (Faine, 2003; White & White, 2000; Studen-Pavolvich & Elliott, 2001; Renfrew Center Foundation, 2003).

*Anorexia nervosa* is defined as a refusal to maintain normal body weight, a fear of gaining weight, a dissatisfaction and disturbance in perceived body shape and weight and *amenorrhea* or loss of menstruation (American Psychiatric Association, 1994). It is estimated that up to 6% of females are diagnosed with anorexia (Makino, Tsuboi & Dennerstein, 2004).

*Bulimia nervosa* is defined by frequent episodes of uncontrolled binge eating followed by compensatory behaviors to prevent weight gain such as vomiting, laxative and diuretic abuse (American Psychiatric Association, 1994). It is estimated that up to 7% females suffer from bulimia (Makino, Tsuboi & Dennerstein, 2004). Although each of these eating disorders exacts a tremendous toll in physical and psychological suffering, the long term implications are even more significant and can be fatal.

Several physical and psychological symptoms are associated with anorexia or bulimia. Most of these symptoms occur when the eating disorder has progressed to more serious stages (White & White, 2000). Tooth erosion is one symptom, however, that occurs in the early stages of an eating disorder; as early as the first six months after the onset of an eating disorder (Faine, 2003; Altshuler, Dechow, Waller & Hardy, 1990; Rytomaa, Jarvinene, Kanerva & Heinonen, 1998). Tooth erosion is the result of starvation associated with anorexia and excessive vomiting associated with bulimia.

Since dental erosion can be the first visible sign of an eating disorder; dentists are in a position to be the clinician to detect eating disorders in the early stages (De Moor, 2004; Faine, 2003; Schmidt & Treasure, 1997). This is especially true since a large majority of adolescents regularly visit the dentist. Results of the National Youth Tobacco Survey indicated that 71% of youth ages 11-18 visited the dentist within the past twelve months (Shelley et al, 2005). Other clinicians, especially primary care physicians, often are not aware of patients with eating disorders because of a lack of visible symptoms until the disease has progressed (Maradiegue, Cecelic, Bozzelli & Frances, 1996; Bursten, Gabel, Brose & Monk, 1996; Karwautz, Wober-Bingol, Wober & Friedrich, 1997; Sayag & Latzer, 2002). Although it is clear that dentists could be the ideal clinicians to detect eating disorders in the early stages, a recent study indicates that dentists are not regularly intervening when they suspect eating disorders in clinical practice, (Elliott & Donatelle, in review). Little is known about what factors influence how often dentists intervene with patients suspected of an eating disorder.

Several other health problems provide examples of areas where dentists have been used to intervene and these provide insight into dentists' behaviors or the lack thereof with specific health problems. Tobacco is an area where dentists have a long history of direct and indirect intervention (Quinn et al, 2005; Shelley et al, 2005; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1999; Fiore, 2000; Tomar, 2001; Albert, Ward, Ahluwalia, & Sadowsky, 2002; Yip, Hay, Ostroff, Stewart & Cruz, 2000). Like eating disorders, tobacco use is a

sensitive issue that requires an early intervention to decrease oral damage (Tomar, 2001). To provide guidance for clinicians intervening with patients that smoke, the United States Public Health Service has specific recommendations for brief and effective interventions strategies for clinicians to use known as the 5A's. The 5A's are widely used among clinicians and are considered the standard for tobacco interventions (Havlicek, Stafne, & Pronk, 2006). The specific intervention strategies are: **A**sk patients about their smoking behaviors, **A**dvice them about the harmful effects of smoking, **A**ssess the patient's willingness to quit, **A**ssist patients in becoming more aware of potential resources to stop smoking and **A**rrange follow-up contacts to prevent relapse. (Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997; Warnakulasuriya, 2002; Barker & Williams, 1999; Shelley et al, 2005; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1999; Fiore, 2000; Tomar, 2001; Albert, Ward, Ahluwalia, & Sadowsky, 2002; Yip, Hay, Ostroff, Stewart & Cruz, 2000). Using these guidelines, along with other strategies, has produced quit rates as high as 34% among patients that smoke (Donatelle, Prows, Hudson, 2002; Shelley et al, 2005; Fiore, 2000; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1997; Warnakulasuriya, 2002, Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997).

Studies exploring potential factors that influence dentists to use a 5A intervention for tobacco have identified three key factors. First, perceived barriers have been identified as being highly related to whether or not dentists engage in 5A tobacco intervention. Dentists who did not feel prepared to

counsel patients on tobacco, believed they had inadequate training or who lacked confidence in their ability to intervene, were unlikely to do so (Warnakulasuriya, 2002; Albert et al, 2002; Ramseier et al, 2006).

On the other side of the continuum, studies have indicated that those who were most likely to engage in the 5A's were those who had received formal training and education (Yip et al, 2000). As a result, there has been an increased effort to create comprehensive tobacco intervention training and education in dental schools (Shelley et al, 2005). The University of Minnesota School of Dentistry serves as one example of a dental school that provides a comprehensive program on tobacco intervention and prevention. Within the program, all dental students are required to practice the 5A's with patients in the dental clinics and are required to discuss one of these interventions with the program director (Stafne & Bakdash, 2004).

Third, research in the area of tobacco has shown that dentists who received systematic post-training and follow-up support through collaborating with other health professionals have been effective in addressing tobacco use with their patients (Havlicek & Stafne, 2006).

Clearly, there are implications from the above findings that may be related to dental interventions with other health problems. One area that may be particularly relevant is the field of eating disorders. Since there are no formal guidelines like the 5A's to assist dentists in intervening with patients suspected of an eating disorder, most dentists have no solid foundation upon which to base their intervention strategies. Furthermore, little is known about

what factors may make such interventions particularly difficult and/or serve to facilitate efficacious interventions.

The purpose of this study was to examine which factors, if any, (demographics, education, professional development, beliefs, perceived barriers) influence dentists' delivery of a set of 5A-like intervention strategies for eating disorders.

## **Methods**

### **Sample Selection**

A stratified, proportional, random sample of Oregon dentists (N=387) was used for this study. A CD ROM containing a list of all licensed Oregon dentists and their mailing addresses was obtained through the Oregon Board of Dentistry. The CD ROM contained a current listing of 2543 Oregon dentists holding a DDS or DMD degree as of January 2005. Dentists were grouped together from this list, based on their geographic region within the state of Oregon according to the Oregon Department of Transportation. The Oregon Department of Transportation geographically divides the state of Oregon into five regions, numbered 1 through 5.

To account for a representative sample, stratified proportional random sampling was the method of selection used in this study (Portney and Watkins, 2000). Regions 4 and 5 were low in population of dentists, so they were combined.

Power was calculated utilizing the program Power and Precision Version 2 (Biostat, 2000). Using a medium effect size of .15 and a power of .90, a

minimum of 130 participants total was required for the study (Biostat, 2000, Cohen, 1992). Thirty percent of each region was selected for a total sample size of 763 (Salant & Dillman, 1994) (see Table 4.14). This was to insure an adequate response rate and a representative sample. Dentists were randomly selected from each region using the random number generator, Research Randomizer, to identify the sample for that region (Urbaniak & Plous, 2006).

## **Measures**

### **Dental Care and Eating Disorder Survey**

An 18-item survey, *The Dental Care and Eating Disorders Survey*, was developed by the researcher to identify intervention strategies for patients suspected of eating disorders. The survey consisted of eleven initial questions that were designed to elicit demographic and background information including gender, age, years as a practicing dentist, location of dental office and size and type of dental office. The other questions on the survey assessed dental education/training about eating disorders, eating disorder related professional development, perceived importance for early intervention by dentist, perceived barriers to intervening with patients suspected of an eating disorder, and how often the dentists performed each of the experts' recommended nine intervention strategies.

The nine intervention strategies were very similar to the 5A's used with tobacco and consisted of: **A**ssess various dental symptoms with the eating disorder, **A**sk the patient suspected of having an eating disorder about their eating patterns using a non-judgmental and subtle approach, **A**dvice the

patient suspected of having an eating disorder about minimizing damage to the teeth such as using mouth wash, etc, Assist the patient suspected of having an eating disorder by providing information on dental consequences associated with abnormal eating patterns and assist the patients suspected of having an eating disorder by providing additional resources, Arrange future follow-up dental visits and arrange referrals with other health professionals . There were two additional strategies that formed a sixth category entitled Other that includes: participate as part of a multidisciplinary team and provide training for all dental staff.

### **Procedure and Analysis**

Prior to survey distribution, experts consisting of faculty and graduate students at Oregon State University examined the survey for content and face validity. The survey was also pilot tested with a sample of eight Oregon dentists to establish readability, face and content validity.

The survey, a self-addressed stamped envelope, a letter of informed consent and a cover letter including survey instructions, a description of the research study and contact information for the researcher was sent to each dentist. Reminder postcards were sent one week and three weeks after the initial mailing to those who had not sent back their survey.

The Statistical Package for the Social Sciences (SPSS) Version 13.0 for Windows was used for data analysis (SPSS, Inc., Chicago, IL). A five block hierarchical linear regression model assessed potential associations between independent variables and how often the dentists engaged in the intervention

strategies. Block composition and order of entry into the hierarchical linear regression model were based on findings from the literature on eating disorder interventions as well as from the related field of tobacco use. Simple linear regression was also used to determine which variables to include in each block. This was done to include only those variables in each block that significantly contributed in explaining the variance in the dependent variable and excluded the variables that were not significant. Blocks were arranged by (1) Demographics, (2) Perceived Barriers, (3) Education/Training, (4) Beliefs, and (5) Professional Development.

The first block, Demographics, consisted of gender, age, geographic region, and number of patients treated per day. The second block, Perceived Barriers, consisted of a total of five variables: lacking privacy or confidentiality, lacking confidence in ability to help a patient with an eating disorder, lacking knowledge about who to refer the patient to, lacking knowledge about eating disorders, and driving the patient away.

The third block, Dental Education, consisted of three variables: educating patients on the risks of eating disorders, discussing eating disorders with patients who show symptoms, and providing referrals to eating disorder professionals.

The fourth block, Beliefs, included three variables: recognizing symptoms of an eating disorder, talking to patients suspected of an eating disorder about their behaviors, and providing resources/referrals for patients suspected of having an eating disorder.



The fifth block, Professional Development, consisted of four variables which were attending conferences, taking continuing education classes, reading journals, and watching media/TV programs to increase knowledge of eating disorders.

The dependent variable was the mean number of times that dentists reported performing the nine potential strategies that were developed prior to this study. The dentists rated how often they performed each strategy on a scale of 0 (Never) to 4 (Always). The rating for each question was summed and then divided by the total number of strategies. The mean score was 1.30 with scores ranging from 0-3.10.

## **Results**

Out of a total of 763 surveys that were mailed, 387 were returned for a final response rate of 50%. Results of this study indicated that the majority of the dentists surveyed were male (83.9%, N= 323), from Geographic Region 1 (63.6%, N=246), attended dental school in Oregon (77.8%, N=305) and practiced general dentistry (88.5%, N=340). The 387 dentists who responded were between twenty eight and eighty one ( $\bar{x} = 49$ ) years of age. The dentists treated between five and forty five ( $\bar{x} = 15$ ) patients per day, had been licensed as a dentist for two to fifty two years ( $\bar{x} = 20$ ), and worked in an office with one other dentist to ten dentists ( $\bar{x} = 2$ ) and zero to twelve dental hygienists ( $\bar{x} = 2$ ).

All blocks except for Demographics, were statistically significant and explained a total of 38.9% of the variance in the dependent variable.

Perceived barriers was the predictor block that explained the most variance.

Age, gender, geographic region, and number of patients treated per day were entered into the first block and accounted for 2.2% of the variance in how often the dentists engaged in the interventions strategies. This block was not statistically significant.

The second block significantly explained 21.5% of the variance in the dependent variable ( $p < .05$ ). A lack of confidence in ability to discuss eating disorders with patients, a lack of eating disorder knowledge, and worrying about driving the patient away, were the three significant variables in Block 2. This finding suggests that dentists that perceived one or more of these three barriers were less likely to engage in the intervention strategies on a regular basis.

Block three explained an additional significant 3.3% of the variance in how often the dentists engaged in the intervention strategies ( $p < .05$ ). Education on eating disorder risks was the only significant variable in the third block. This result indicates that the more education the dentists reported receiving about the risks of eating disorders, the more likely they were to engage in the intervention strategies on a regular basis.

The fourth block accounted for a significant 3.4% ( $p < .05$ ) of the explained variance in how often the dentists engaged in the intervention strategies. Talking to patients about eating disorders was the only significant variable in

Block four. This result suggest that the more dentists believed it was important to talk to patients about eating disorders the more likely they were to engage in the intervention strategies on a regular basis.

The fifth block explained a significant 8.6% of the variance in how often the dentists engaged in the intervention strategies ( $p < .05$ ). Continuing education classes and watching TV/media programs were the two significant variables in the fifth block. This finding indicates that dentists that reported taking continuing education classes or watching TV/media programs to increase their knowledge of eating disorders were more likely to engage in the intervention strategies on a regular basis (see Tables 4.15 & 4.16).

**Table 4.15 Determinants of overall frequency dentists perform the nine preliminary strategies with patients suspected of an eating disorder.**

Factor	R <sup>2</sup>	Δ R <sup>2</sup>	F	Δ F	Significance Δ F
Block 1: Demographics	.022	.022	2.049	2.049	.087
Block 2: Perceived Barriers	.237	.215	11.157	16.874	.000
Block 3: Dental Education	.270	.033	10.141	5.394	.001
Block 4: Beliefs	.304	.034	9.660	5.803	.001
Block 5: Professional Development	.389	.086	11.165	12.264	.000
Total N=387					

A five block hierarchical regression strategy was used. R<sup>2</sup> and F refer to the overall regression after each block has been entered into the model, Δ R<sup>2</sup>, Δ F, Significance and Δ F describe the contributions of each block.

**Table 4.16 Complete five block hierarchical regression model with all variables entered for each block**

Determinant	B	S.E.	$\beta$	t	p
Block 1:					
Gender	.146	.103	.074	1.423	.155
Age	.049	.036	.069	1.337	.182
Geographic Region	.032	.050	.042	.641	.522
# of patients treated per day	.096	.074	.084	1.294	.196
Block 2:					
Lack of confidentiality	-.049	.035	-.075	-1.397	.163
Lack of confidence in ability	-.271	.042	-.336	-6.444	.000*
Lack of eating disorder knowledge	-.127	.046	-.162	-2.736	.007*
Worry about driving patient away	-.079	.039	-.112	-2.049	.041*
Lack of referral knowledge	.018	.041	.027	.429	.668
Block 3:					
Educating patient on risks of eating disorders	.114	.046	.179	2.486	.013*
Discussing eating disorders with suspected patients	.041	.059	.062	.692	.489
Providing referrals	-.011	.063	-.014	-.181	.856
Block 4:					
Talk to patients about risks of eating disorders	.221	.068	.242	3.268	.001*
Recognize symptoms of an eating disorder	.019	.083	.015	.223	.824
Provide resources/referrals for patients with eating disorders	.097	.054	.105	1.782	.076
Block 5:					
Reading journals	.015	.038	.025	.389	.698
Attending conferences	.028	.050	.037	.548	.584
Continuing education courses	.217	.049	.292	4.462	.000*
Watching TV programs on ed	.085	.030	.147	2.781	.006*

Statistics in the columns are unstandardized regression coefficients (B), associated standard errors (S.E.), standardized regression coefficients ( $\beta$ ), significance tests of each variable in the model (t), and associated p values (p).  
\* p < .05.

## Discussion

The purpose of this study was to determine which factors, if any, (demographics, education/training, professional development, beliefs and perceived barriers) influence the dentist's delivery of a set of 5A-like intervention strategies on a regular basis. Determinants and their order of entry were based on a review of the literature from the related field of tobacco and dental interventions.

The findings from this study indicated that all blocks except the Demographic block were statistically significant. It should be noted that overall, dentists were not likely to regularly engage in intervention strategies with eating disorder patients ( $\bar{x}=1.30$ ). This low score of regularly engaging in the intervention strategies was related to perceived a lack of confidence in ability to discuss eating disorders with the patient, a lack of eating disorder knowledge, and a concern about driving the patient away. This is consistent with previous findings in tobacco, which have indicated perceived barriers to be strongly associated with how often dentists engage in tobacco interventions with patients (Warnakulasuriya, 2002; Ramseier et al, 2006, Yip et al, 2000; Albert et al, 2002).

Dentists who were more likely to regularly engage in the intervention strategies had received education on risks of eating disorders, believed it was important to talk to patients about eating disorders, and participated in continuing education courses or watching TV programs on eating disorders.

This finding is also consistent with the tobacco literature which has indicated that those who are most likely to engage in the 5A's are those who have received formal education on tobacco (Yip et al, 2000). Furthermore, research in the area of tobacco has shown that dentists who received systematic post-training and follow-up support through collaborating with other health professionals can be effective in addressing tobacco use with their patients (Havlicek & Stafne, 2006). Post training and communicating with other health professionals are important factors to consider for dentists currently in clinical practice in order to increase the likelihood in engaging in the intervention strategies on a regular basis (Havlicek & Stafne, 2006).

In summary, the results of this study indicate that perceived barriers, level of education/training about eating disorders in dental school, beliefs about intervening, and subsequent professional development activities to increase eating disorder knowledge, significantly influence how often dentists engage in 5A-like intervention strategies. The low mean score of the dependent variable indicates that the majority of the dentists were not regularly engaging in the intervention strategies and perceived barriers were explained the most variance in the dependent variable.

To increase the likelihood of dentists performing these intervention strategies or a similar set of standard guidelines, there are two main recommendations. First, providing education and clinical training in dental school that is similar to the University of Minnesota School of Dentistry's comprehensive tobacco intervention program could reduce perceived barriers

such as a lack of confidence in ability and lack of eating disorder knowledge, two barriers identified as significant in this study. This could provide dental students with the opportunity to understand and gain necessary skills in communicating with patients.

Second, providing more post dental school opportunities could decrease perceived barriers among dentists currently in clinical practice. Providing more opportunities after dental school through continuing education classes and collaboration with other health professionals could increase the likelihood of dentists engaging in the intervention strategies on a regular basis.

There were three limitations for this study. First, the study population was limited to a representative sample of Oregon dentists and as such the results cannot be generalized to dentists outside of Oregon. Second, the results of the survey are based on self-report and depended on the participants' accuracy and honesty in filling out the survey. Lastly, the response was limited to the voluntary action of the participants in filling out the survey and mailing it back with a provided self-addressed stamped envelope.

Since dentists are in a role to be the first clinician to detect an eating disorder, efficacious interventions are likely to depend on providing dentists with knowledge about eating disorders either in dental school or through post training. Until dentists have the professional opportunities to feel confident in eating disorder interventions and to collaborate as part of a multidisciplinary team, their potential in helping remediate these difficult conditions will remain unrealized.

## CHAPTER 5

### DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This study examines the potential roles and responsibilities of dentists intervening with patients suspected of eating disorders as well as their readiness to actually intervene in their current clinical settings. Through this study, the experts in Part I indicated consensus that dentists should be the professionals in the dental office to communicate with the patient about eating disorders. They also indicated strong agreement about nine intervention strategies that should be part of the clinical strategies used with suspected eating disorders. The findings in Part II showed that the majority of dentists believed that it was their responsibility to intervene with patients suspected of an eating disorder, however, they were not engaging in the intervention strategies on a regular basis. Perceived barriers, level of education/training about eating disorders in dental school, beliefs about intervening, and subsequent professional development activities to increase eating disorder knowledge, significantly influenced how often dentists engaged in 5A-like intervention strategies.

This study contributes to the areas of eating disorder research and dental interventions by supporting past literature that indicates that the dentist's role is to intervene early with patients suspected of an eating disorder. This study further provides a starting point for developing a set of 5A-like intervention



strategies designed to assist dentists in intervening with patients suspected of an eating disorder. From this study, there are three key recommendations.

The first recommendation is that further research is needed to establish guidelines for dental care and eating disorders that are similar to the 5A's for tobacco interventions. The 5A's have provided clinicians with brief and effective tobacco interventions with patients who smoke (Dolan, Mcgorray, Grinstead-Skigen, & Mecklenburg, 1997; Warnakulasuriya, 2002; Barker & Williams, 1999; Shelley et al, 2005; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1997; Fiore, 2000; Tomar, 2001; Albert, Ward, Ahluwalia, & Sadowsky, 2002; Yip, Hay, Ostroff, Stewart & Cruz, 2000).

Experts agreed upon nine strategies, seven of which are nearly identical to the 5A's used with tobacco. These included: **Assess** various dental symptoms with the eating disorder, **Ask** the patient suspected of having an eating disorder about their eating patterns using a non-judgmental and subtle approach, **Advise** the patient suspected of having an eating disorder about minimizing damage to the teeth such as using mouth wash, etc, **Assist** the patient suspected of having an eating disorder by providing information on dental consequences associated with abnormal eating patterns and assist the patients suspected of having an eating disorder by providing additional resources, **Arrange** future follow-up dental visits with the patient suspected of having an eating disorder and arrange referrals to other health professionals. The experts also identified two additional strategies that they believe is important for a dentist to do when intervening with a patient suspected of an

eating disorder. These strategies formed a sixth category “Other” that includes: Participate as part of a multidisciplinary team and provide training for all dental staff. This framework for a 5A-like intervention for eating disorders could be used to: define the roles and responsibilities of dentists, reduce perceived barriers, provide training/skills for dentists and create more of a collaborative multidisciplinary team of health professionals when intervening with a patient suspected of an eating disorder. These guidelines could increase the chances of early detection and intervention by dentists and significantly increase the chances for a favorable outcome for the patient suspected of an eating disorder (Brown & Bonifazi, 1993; Marks, Beumont, & Birmingham, 2003).

In addition to the development of guidelines, it is also important that these guidelines are endorsed by dental organizations as they have been in the area of tobacco (Shelley et al, 2005). This supportive system has played a key role in encouraging the use of the 5A’s for tobacco among clinicians (US Public Health Service Report, 2000). Approximately 50 dental organizations have developed and utilized policy statements about tobacco use (Tomar, 2001). The National Cancer Institute has developed a National Dental Tobacco-Free Steering Committee which encourages oral health teams and dental organizations to routinely advise patients on quitting tobacco use. The International Dental Federation urges oral health professionals to take action to reduce tobacco use (Warnakulasuriya, 2002). Lastly, the American Dental Association strongly encourages its members to be educated about tobacco

interventions and to educate patients on tobacco (Stafne & Bakdash, 2004).

This study serves to demonstrate that experts from the fields of eating disorders and dental interventions do support the development of standard guidelines to use with patients suspected of an eating disorder. If such dental interventions are ever to gain national prominence, they must have the strong endorsement of professional organizations.

The second recommendation is that further research is needed to examine training/education on eating disorders in dental school curricula. Since the majority of dentists in this study reported receiving little or no information on eating disorders in dental school, training and education should be examined to include more information on eating disorders. Those programs that are found deficient, should adopt curricular requirements that provide additional information and skills training on eating disorders. Additionally, since it was clear from study results that dentists do not feel comfortable communicating with patients about possible eating disorders, dental education programs should enhance curricula dealing with doctor-patient communication about difficult topics as well as providing information on how to best provide resources and referral for those in need and work as a multidisciplinary team. The results of the study indicated that dentists were not providing staff training and the role of the dental hygienist should further be explored. When addressing the multidisciplinary approach in dental school curricula the dental hygienist should be considered in assisting with delivery and communicating with the patient as a team approach with the dentist. In considering delivery

of the intervention with adolescents, dentists should also receive information in dental school on the parental influence of eating disorders. Negative family influences including physical and sexual abuse are considered secondary risk factors for eating disorders and discussing the adolescents' eating habits with their parents should be carefully addressed in dental school. These improvements in dental school educational programs could increase the likelihood of dentists being adequately prepared as well as increase confidence in their ability to use these strategies in clinical practice.

The third recommendation is to provide post training and professional opportunities for dentists who are currently in practice. Research in the area of tobacco has shown that dentists who received systematic post-training and follow-up support through collaborating with other health professionals have been effective in addressing tobacco use with their patients (Havlicek & Stafne, 2006). The results from this study indicated that those who were most likely to engage in the intervention strategies were those who participated in professional development opportunities. Training and professional collaboration for dentists who are already in practice are important factors to consider in order to provide skills and support for engaging in the intervention strategies. Providing more opportunities after dental school through continuing education classes and collaboration with other health professionals could increase the likelihood of dentists engaging in the intervention strategies on a regular basis.

In conclusion, based on findings in this study, it is clear that dentists lack vital skills and knowledge in communicating with patients suspected of an eating disorder. By creating a standard set of intervention strategies modeled after those used for tobacco and endorsed by professional dental organizations, future dentists will be more effective in early interventions for eating disordered patients. It is evident that early interventions properly delivered and offered as part of a continuum of care that quickly moves to treatment by other trained clinicians, offer the best hope of recovery for persons with eating disorders.

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**APPENDICES**



**Appendix A:**  
**Delphi Survey Round 1**

## DENTAL CARE AND EATING DISORDERS DELPHI SURVEY

**Instructions:** Listed below are fifteen actions/behaviors that have been identified from the literature as important for dentists to perform regarding patients they suspect of having an eating disorder. As an expert in eating disorders, please indicate how important you believe it is that dentists perform each of the following on a scale of 1(not important) to 3 (extremely important) and return the survey in the enclosed self addressed stamped envelope. Thank you for your time and participation.

	Not Important	Somewhat Important	Extremely Important
1. Ask the patient suspected of having an eating disorder about their abnormal eating patterns using a non judgmental approach	1	2	3
2. Ask questions regarding disordered eating on a written health history form that all patients must answer and update with each visit	1	2	3
3. Recognize the stage and severity of the dental symptoms associated with an eating disorder	1	2	3
4. Provide the patient with education regarding dental complications associated with abnormal eating patterns	1	2	3
5. Provide the patient with nutritional education regarding complications associated with abnormal eating patterns	1	2	3
6. Provide the patient with education regarding medical and psychological complications associated with abnormal eating	1	2	3
7. Provide advice regarding minimizing damage to the teeth such as using mouthwash, brushing, etc.	1	2	3
8. Maintain regular communication with other professionals to Work as a multidisciplinary team	1	2	3
9. Manage and continue to treat the patient providing basic care	1	2	3
10. Explain to the patient that no restorative work will be done until recovery from the eating disorder is established	1	2	3
11. Provide names and referrals to physicians	1	2	3
12. Provide referrals to a dietician or nutritionist	1	2	3
13. Provide referrals to a psychologist, psychiatrist or therapist	1	2	3
14. Provide some type of training for the staff, including dental assistants and dental hygienists	1	2	3
15. Other (please describe)_____	1	2	3

From the above practices, which do you think are the five MOST important: (Please circle the number of that corresponds with the practice above).

1    2    3    4    5    6    7    8    9    10    11    12    13    14    15

**Appendix B:**  
**Delphi Survey Round 2**

### Dental Care and Eating Disorders Delphi Survey

**Instructions:** Listed below are nine actions/behaviors that experts from Round 1 identified as important for dentists to do when they suspect patients of having an eating disorder. Please indicate how important you believe it is that dentists perform each of the following on a scale of 0 (not important) to 4 (very important) and return the survey in the enclosed self addressed stamped envelope. Thank you for your time and participation.

	Not Important	Somewhat Important	Neutral	Important	Very Important
1. Recognize and assess various dental symptoms associated with an eating disorder	0	1	2	3	4
2. Ask the patient suspected of having an eating disorder about their eating patterns using a non-judgmental and subtle approach	0	1	2	3	4
3. Assist the patient suspected of having an eating disorder by providing information regarding dental consequences associated with abnormal eating patterns	0	1	2	3	4
4. Advise the patient suspected of having an eating disorder about minimizing damage to the teeth such as using mouthwash, brushing, etc	0	1	2	3	4
5. Provide referrals to:					
a. physician	0	1	2	3	4
b. dietitian/nutritionist	0	1	2	3	4
c. therapist/psychologist/psychiatrist	0	1	2	3	4
d. other _____	0	1	2	3	4
6. Be involved as part of a multidisciplinary team focused on patient care for eating disorders	0	1	2	3	4
7. Arrange future follow-up dental visits with the patient suspected of having an eating disorder	0	1	2	3	4
8. Provide training for dental staff on how to communicate with patients suspected of an eating disorder	0	1	2	3	4
9. Assist the patient suspected of having an eating disorder by providing additional resources in the form of:					
a. websites	0	1	2	3	4
b. pamphlets	0	1	2	3	4
c. brochures	0	1	2	3	4
d. Other _____	0	1	2	3	4
10. Other (not listed previously, but important actions that a dentist should do)					
_____	0	1	2	3	4
_____					

11. If the dentist only had time to do 5 of the above activities with a patient suspected of having an eating disorder, which 5 activities do you believe dentists should do (List the number of the activities below in the provided spaces)

Most Important	Fifth Most Important
1. _____	5. _____
2. _____	4. _____
3. _____	

12. Which professional should be the first person the dentist should refer the patient to when he/she encounters a patient in the early stages of an eating disorder?

- a. physician
- b. dietitian/nutritionist
- c. therapist/psychologist/psychiatrist
- d. other \_\_\_\_\_

13. When a patient is first identified as having a potential eating disorder, which dental practitioner do you think should have the primary responsibility for communicating with these patients?

- a. dentist
- b. dental hygienist
- c. dental assistant
- d. receptionist
- e. other (please specify) \_\_\_\_\_

Do you have any additional thoughts/comments about the roles/responsibilities of dentists in being part of a team focused on eating disorder patients?

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**Thank you!**

**Appendix C:**  
**Dentist Survey**

## Dental Care and Eating Disorders Survey

**The purpose of this survey is to determine dentist involvement in detecting eating disorders. The questions below refer to two types of eating disorders, anorexia and bulimia.**

- *anorexia*: “the refusal to maintain body weight at or above a minimally normal weight for age and height”
- *bulimia*: “binging accompanied with behaviors such as purging, laxative and diuretic abuse”

**Your responses will be confidential. When you are finished, please return the survey in the self addressed stamped envelope provided. Thank you for your time.**

1. What is your gender? \_\_\_\_\_ Male \_\_\_\_\_ Female
2. What is your age? \_\_\_\_\_ years
3. What type of dentistry do you practice (general, periodontal, pediatric dentistry, etc)?  
\_\_\_\_\_
4. Number of years as a licensed dentist: \_\_\_\_\_ years
5. Number of dentists in your office (including yourself): \_\_\_\_\_ dentists
6. Number of dental hygienists in your office: \_\_\_\_\_ dental hygienists
7. How many patients do you treat on an average day? \_\_\_\_\_ patients
8. When did you graduate from dental school (year)? \_\_\_\_\_
9. Location of School (State): \_\_\_\_\_
10. Have you or a family member/close friend ever suffered from anorexia or bulimia?  
\_\_\_\_\_ No \_\_\_\_\_ Yes
11. Within the past six months, approximately what percentage of your patients have you suspected to have had either anorexia or bulimia? (see definition at top of page)  
\_\_\_\_\_ 0 %  
\_\_\_\_\_ 1-5%  
\_\_\_\_\_ 6-10%  
\_\_\_\_\_ 11-15%  
\_\_\_\_\_ 16-20%  
\_\_\_\_\_ 20% +
12. In an average month, how many patients have you talked to about either anorexia or bulimia?  
\_\_\_\_\_ patients

**13.** On a scale from **0 (not at all)** to **4 (a lot)** how much did your dental school education prepare you to perform the following activities:

	Not at all	Not Very much	Somewhat	Quite a bit	A lot
1. Recognize risk factors associated with eating disorders	0	1	2	3	4
2. Provide oral care for teeth affected by eating disorders	0	1	2	3	4
3. Discuss eating disorders with patients who show symptoms	0	1	2	3	4
4. Provide referrals to eating disorder professionals	0	1	2	3	4
5. Educate patients on the risks of eating disorders	0	1	2	3	4
6. Educate obese patients regarding their eating patterns and the risks associated with oral health	0	1	2	3	4
7. Discuss tobacco use with patients who show symptoms	0	1	2	3	4

\_\_\_\_\_ I did not receive education on any of the activities listed above

Comments:

**14.** How much information/training did you receive in dental school on eating disorders?

- \_\_\_\_\_ None  
 \_\_\_\_\_ Not Very Much  
 \_\_\_\_\_ Some  
 \_\_\_\_\_ Quite a bit  
 \_\_\_\_\_ A lot

**15.** During dental school do you recall taking any courses that provided information on how to talk to patients on the following topics (check all that apply):

1. \_\_\_\_\_ Tobacco interventions  
 2. \_\_\_\_\_ Poor oral hygiene  
 3. \_\_\_\_\_ Obesity  
 4. \_\_\_\_\_ Other sensitive topics (please specify): \_\_\_\_\_

\_\_\_\_\_ I did not take any courses that addressed these issues

Comments:



**16.** In the past two years, how many activities have you participated in that enhanced your knowledge of eating disorders:

1. Conference sessions	0	1	2	3	4+
2. Journal articles/other literature	0	1	2	3	4+
3. Continuing education courses	0	1	2	3	4+
4. Media/Computer/TV programs	0	1	2	3	4+
5. Other (please specify): _____	0	1	2	3	4+

\_\_\_\_\_ I have not obtained further information on eating disorders.

Comments:

**17.** On a scale from **0 (not important) to 4 (very important)** how important do you think it is for dentists to do the following actions:

	Not Important	Somewhat Important	Neutral	Important	Very Important
1. Recognize symptoms of an eating disorder	0	1	2	3	4
2. Talk to patients suspected of an eating disorder about their behaviors	0	1	2	3	4
3. Advise the patient suspected of an eating disorder about the dental risks of their behaviors	0	1	2	3	4
4. Play a role in early diagnosis of eating disorders	0	1	2	3	4
5. Provide resources/referrals for patients suspected of having an eating disorder	0	1	2	3	4

Comments:

**18.** On a scale from **0 (not a problem) to 4 (major problem)** how much of a problem/barrier do you think each of the following would be for you in working with eating disorder patients:

	Not a problem	Rarely a problem	Somewhat a problem	Quite a problem	Major problem
1. Amount of time required to discuss eating disorders	0	1	2	3	4
2. Confidentiality issues, lack of privacy	0	1	2	3	4
3. Confidence in my ability to help patients with eating disorders	0	1	2	3	4
4. Patient refusing to accept help for their eating disorder	0	1	2	3	4
5. Lack of knowledge about who to refer the patient to (names of physicians, therapists, etc)	0	1	2	3	4
6. Lack of adequate knowledge of eating disorders	0	1	2	3	4
7. Worry about driving the patient away	0	1	2	3	4

Comments:

19. On a scale from **0 (never) to 4 (always)** rate how frequently you perform the following actions:

	Never	Rarely	Sometimes	Often	Always
1. Recognize and assess various dental symptoms associated with an eating disorder	0	1	2	3	4
2. Ask the patient suspected of having an eating disorder about their eating patterns	0	1	2	3	4
3. Assist the patient suspected of having an eating disorder by providing information regarding dental consequences associated with abnormal eating patterns	0	1	2	3	4
4. Advise the patient suspected of having an eating disorder about minimizing damage to the teeth such as using mouth wash, brushing, etc.	0	1	2	3	4
5. Provide referrals to:					
a. physician	0	1	2	3	4
b. therapist/psychologist/psychiatrist	0	1	2	3	4
6. Participate as part of a multidisciplinary team focused on patient care for eating disorders	0	1	2	3	4
7. Arrange future follow-up dental visits with the patient suspected of having an eating disorder	0	1	2	3	4
8. Provide training for dental staff on how to communicate with patients suspected of an eating disorder	0	1	2	3	4
9. Assist the patient suspected of having an eating disorder by providing additional resources (websites, pamphlets, brochures, etc)	0	1	2	3	4

**Is there any additional information you would like to share regarding your thoughts on eating disorders and dental care?**

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**Thank you for completing the survey!**

