

1-1-2022

Eating Disorders in Adolescents: Facts and Recommendations for the Oral Health Care Team

Catherine A. Miller MD

The University of Michigan Division of Adolescent Medicine, ktmil@med.umich.edu

James R. Boynton DDS, MS

University of Michigan School of Dentistry Pediatric Dentistry, jboynton@umich.edu

Terrill Bravender MD, MPH

The University of Michigan Division Director of Adolescent Medicine, tdbrave@med.umich.edu

Follow this and additional works at: <https://commons.ada.org/journalmichigandentalassociation>



Part of the Behavioral Medicine Commons, Dental Public Health and Education Commons, Health Law and Policy Commons, Human Resources Management Commons, Leadership Commons, Mental and Social Health Commons, Other Dentistry Commons, Pediatric Dentistry and Pedodontics Commons, and the Pediatrics Commons

Recommended Citation

Miller, Catherine A. MD; Boynton, James R. DDS, MS; and Bravender, Terrill MD, MPH (2022) "Eating Disorders in Adolescents: Facts and Recommendations for the Oral Health Care Team," *The Journal of the Michigan Dental Association*: Vol. 104: No. 1, Article 2.

Available at: <https://commons.ada.org/journalmichigandentalassociation/vol104/iss1/2>

This Cover Story is brought to you for free and open access by the State & Local Dental Publications at ADACCommons. It has been accepted for inclusion in The Journal of the Michigan Dental Association by an authorized editor of ADACCommons. For more information, please contact commons@ada.org.



Abstract:

Eating disorders typically begin during the adolescent years. These disorders are a spectrum of thoughts and behaviors related to food, weight, and exercise that lead to significant psychological and physical morbidity. Medical complications of eating disorders are common and can be life-threatening. Dental providers can play an important role in care by recognizing oral signs and symptoms associated with eating disorders, giving advice on mitigating these issues, and helping patients and families connect with appropriate care. In this article, we provide key information about eating disorders, the complications including oral health issues, and advice for dental providers regarding care and local resources.

Eating Disorders in Adolescents: Facts and Recommendations for the Oral Health Care Team

By Catherine A. Miller, MD, James R. Boynton, DDS, MS,
and Terrill Bravender, MD, MPH

Dental providers typically see adolescents every six months and thus may be the first health care providers to identify physical health problems associated with eating disorders. However, many dental providers are not familiar with the oral health issues associated with eating disorders. In one study, only 55% of dentists could identify xerostomia as an eating disorder complication, and fewer than half identified parotid enlargement or dysfunction as being potentially related to an eating disorder.¹

In order to identify eating disorders early and refer for a full diagnostic evaluation, dental providers need to be familiar with the signs and symptoms of eating disorders and be comfortable discussing these concerns with families.

The central behaviors in eating disorders include restrictive eating, binge eating, and compensatory weight loss behaviors (self-induced vomiting, compulsive exercise, use of diet pills, laxatives, diuretics, and periods of starvation). These behaviors may be secretive and associated with feelings of shame, making communication with care providers challenging. The diagnostic criteria for eating disorders according to the *Diagnostic and Statistical Manual of Mental Disorders 5th Edition* are summarized below.² Though patients can shift between diagnostic categories over time, they fall into only one eating disorder

(Continued on Page 40)

Table 1 — Signs and Symptoms of Eating Disorders.**Malnutrition related:**

- Abnormal vital signs: low resting heart rate and blood pressure, hypothermia, orthostatic increase in heart rate and drop in blood pressure
- Cool extremities and poor perfusion
- Cardiac: arrhythmias, decreased cardiac muscle mass
- Electrolyte derangements, dehydration, and edema
- Bone marrow suppression: anemia, low white blood cell count, and low platelet count
- Mood/cognitive changes: low and anxious mood, obsessive-compulsive symptoms, and slowed cognition
- Pubertal delay or interruption
- Constipation and delayed gastric emptying
- Hair thinning
- Weight loss, growth delay, muscle wasting, cachexia
- Pallor, yellow-orange tinge to skin (particularly palms and soles)
- Loss of menses
- Low bone density

Purging related:

- Electrolyte derangements: low potassium, low chloride
- Abnormal vital signs: orthostatic increase in heart rate and drop in blood pressure
- Abrasion or callous formation on knuckles from self-induced vomiting
- Angular cheilitis, palatal abrasions, dental enamel erosion
- Acid reflux and abdominal pain
- Salivary gland enlargement (parotid and submandibular)
- Laxative dependence

Binge-eating related:

- Rapid weight increases
- Elevated blood pressure
- Signs of insulin resistance: acanthosis nigricans
- Abdominal pain

diagnostic category at a given time.²

Anorexia nervosa (AN) is characterized by a restriction of food intake, which leads to a significantly low body weight, an intense fear of weight gain, and a disturbance in the perception of body weight or size. There are two subtypes: Restricting or binge-eating/purging.

Bulimia nervosa (BN) involves both binge eating and purging behaviors, which occur at least once per week for three months. Binge eating is consumption of a very large amount of food in a discrete period of time with perceived lack of control. Purging methods are an attempt to avoid weight gain or induce weight loss and can include self-induced vomiting, excessive exercise, periods of food restriction, and abuse of laxatives or other medications.

Binge-eating disorder (BED) involves binge eating episodes at least

once per week for three months, without compensatory purging behaviors. Binge eating causes distress and is often faster than normal eating. The binge may continue past fullness/discomfort, be initiated without hunger, and be secretive due to embarrassment.

Avoidant/restrictive food intake disorder (ARFID) is characterized by restriction of food intake with failure to meet nutritional needs leading to weight loss, failure to gain weight along normal developmental trajectory, dependency on supplemental nutrition, and/or significant impairment of psychosocial functioning. This restriction is due to lack of interest in or avoidance of food. Food avoidance may be because of sensory characteristics of the food or concerns about consequences, such as choking or vomiting. Unlike AN, there is no distortion of body image.

Other specified feeding or eating

disorders (OSFED) is used when a person presents with eating behaviors that cause clinically significant impairment but do not meet the full criteria of the other disorders. For example, a person may meet all criteria for anorexia nervosa except that they are within their normal weight range, or all criteria for bulimia nervosa except that binge-eating and purging is happening at a lower frequency than once per week.

Epidemiology and treatment

Eating disorders have been characterized as illnesses impacting white, affluent, thin adolescent females. However, eating disorders are increasingly recognized in people of a range of body sizes, younger ages, males, and across all racial and ethnic populations and socioeconomic groups.³⁻⁵ Historically, the screening for eating disorders has focused on a

thin-ideal body image common among females which may miss males with muscularity as the central focus of an ideal body image.⁶ The perception that eating disorders are a female disorder can impact willingness to seek help and may be a factor in severity of illness at presentation, with approximately 50% of male adolescents presenting for treatment needing hospitalization.^{7,8} The lifetime prevalence for AN and BN are estimated to be 0.5-2% and 0.9-3% respectively.^{3,9} BED is the most common eating disorder, with a lifetime prevalence estimated to be 2-3.5%.⁹ The ratio of females to males with BED is more balanced than with AN and BN.¹⁰ The lifetime prevalence for ARFID is not yet determined, but patients with ARFID make up about 15% of patients who present for care in eating disorder programs.¹¹ ARFID patients tend to be younger, with a higher percentage of males, and higher incidence of anxiety disorders and autism spectrum disorder when compared to patients with other eating disorder diagnoses.¹¹

The development of eating disorders involves multiple risk factors including genetic susceptibility, social/environmental influences, and psychological traits. For people who are genetically predisposed, some of the other factors that can increase the risk for eating disorders are dieting behavior, type 1 diabetes or other chronic illnesses requiring dietary control, and familial eating issues.¹²⁻¹⁴ Additional influencing factors include participation in sports that focus on strict weight classes or a thin aesthetic, early puberty in females, perfectionism, sexual abuse, low self-esteem, and sexual minority youth status.¹⁵

The COVID-19 pandemic has been a collective social/environmental stressor, and adolescents have been struggling with higher rates of mental health issues, including eating disorders.^{16,17} Our children's hospital in Michigan had more than a two-fold increase in hospital admissions for adolescents with eating disorders during the first year of the pandemic compared to our pre-pandemic yearly admission rates.¹⁸

All eating disorders are associated with increased mortality rates.¹⁹ Mortality rates are most striking in AN, which has the highest mortality rate of all psychiatric disorders.¹⁹ Long term follow-up studies show premature death is five to six times higher in patients with AN and two to three times higher for those with BN.²⁰ Suicide rates are also increased in patients with eating disorder, accounting for about 20% of deaths.¹⁹

Most patients with eating disorders can be managed in an outpatient setting with collaboration among mental health and medical providers. Evidence-based therapeutic approaches include family-based treatment and cognitive behavioral therapy.⁵ Some patients will need a more intensive level of care in a day-treatment program or

residential program. If patients are unstable medically or psychiatrically (for example, with low heart rates, blood pressures, electrolyte derangements, acute food refusal, active suicidal ideation) they may require hospital-based stabilization.⁵

Treatment is often needed long-term over the course of a year to several years. There is a better chance for full recovery from an eating disorder during adolescent years than during adulthood.²¹ Overall, the recovery rate for adolescents is around 70%, with recovery associated with higher weight at diagnosis and shorter duration of illness, underscoring the importance of early identification and intervention.^{5,22}

Signs/symptoms

Eating disorders can impact all organ systems as a result of purging, binge-eating behaviors, and due to the body's physiologic changes from malnutrition.³ Typical signs and symptoms are summarized in Table 1 (Page 40),^{3,5,23} and the dental and oral health complications are further described below.

Dental erosions and caries. Erosion is the loss of enamel or dentin through a mechanical or chemical process, rather than a bacterial process.²⁴ Highly acidic regurgitated stomach contents erode tooth structure in a process termed perimolysis.²⁵ Erosion of the lingual surfaces of the maxillary incisors and canines are the most clearly established oral pathology associated with eating disorders when there is self-induced vomiting.^{26,27} About one-third of patients with BN report brushing their teeth immediately after vomiting, a behavior that may increase the risk of enamel erosion.²⁸

In a 2015 meta-analysis, patients with self-induced vomiting had the highest likelihood of dental erosion, greater than seven times more likely when compared to healthy controls. Interestingly, patients with eating disorders without vomiting still had a significantly greater likelihood of dental erosion, more than three times as likely compared to healthy controls.²⁶ Erosion of the lingual surface of the maxillary incisors may show a "pseudo chamfer," a thin band of less-affected tooth structure at the gingival margin. In the early stages of loss of tooth structure, the enamel may be air dried to evaluate for etching of the enamel surface.²⁵ The frequency, duration, and number of vomiting episodes have not shown a linear association with erosion of tooth structure.²⁹ The pattern of erosion in patients who are not vomiting show greater involvement of the teeth facing the lips and cheeks.³⁰

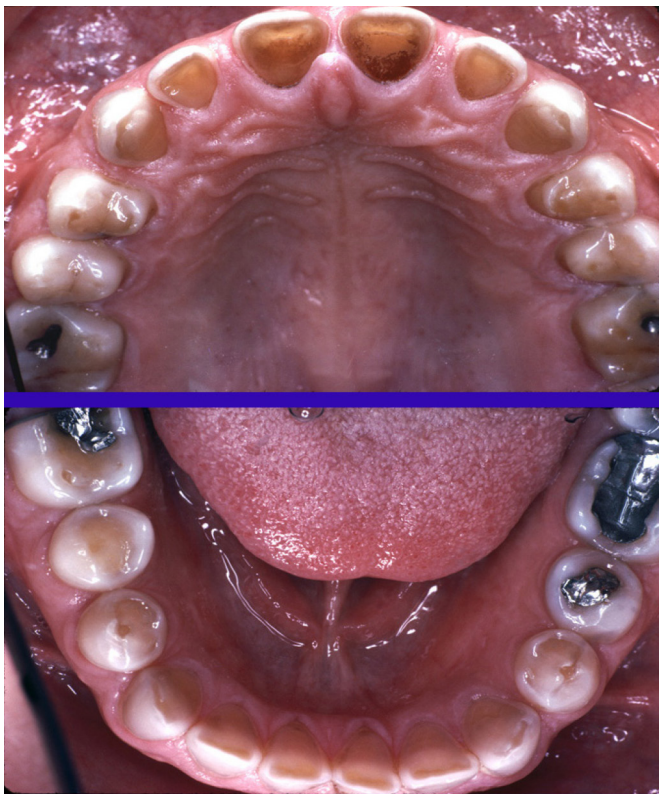
Other factors such as greater consumption of acidic foods like fruits, increased ingestion of carbonated beverages for appetite suppression, and obsessive oral

(Continued on Page 42)

hygiene habits may also play a role in the development of dental erosion and dental sensitivity.²⁶ Patients with eating disorders also have significantly more caries and restored teeth when compared with healthy controls.²⁶ With continued vomiting, progressive loss of enamel and dentin, pulp pathology, elongated clinical crowns, and loss of vertical dimension may occur, and even extensive dental treatment may be futile.²⁵ Definitive dental treatment (i.e., fixed prosthodontics) should be deferred until after the eating disorder is under control.³¹

Salivary gland abnormalities. Xerostomia, dryness of the mouth from decreased salivary flow, is associated with eating disorders and can be due to salivary gland dysfunction, chronic dehydration, or may be a side effect of psychiatric medications.^{5,32} Xerostomia can decrease the oral pH, leading to a loss of mineral from tooth structure and an increase in cariogenic bacteria.⁵

Fig. 1 — Preoperative upper and lower occlusal image. Clinical evidence of erosions with different degrees of enamel and dentin loss in the whole set of teeth. (Photo: BAOJ Dentistry).³⁶



Another characteristic finding with binge-eating and self-induced vomiting behaviors is enlargement of the salivary glands, or sialadenosis. Parotid gland enlargement is often most noticeable, but all salivary glands can be affected (Figure 3).³³ The exact mechanism for sialadenosis is not fully understood, but theories include hypertrophy from increased work of the glands or from chronic increased autonomic nervous system stimulation.³³ The salivary gland enlargement is painless, soft, and salivary flow appears to be normal.³¹ The gland enlargement often peaks a few days after frequent self-induced vomiting has stopped, and will then subside.³³

Oral mucosal lesions. Angular cheilitis can be due to nutritional deficiencies such as zinc, tissue trauma, or xerostomia.³² Frequent acid exposure, direct trauma from fingers or other objects used to induce vomiting, and trauma due to rapid ingestion of large amounts of food during binge-eating episodes can all cause oral tissue damage.³² Glossitis may occur in patients with nutritional deficiencies such as vitamin B12.³⁴

Altered taste. Hypogeusia, a diminished sense of taste, can occur in patients with eating disorders and may promote restrictive eating.³² Loss of tongue papillae due to vitamin and mineral deficiencies (particularly zinc), mucosal atrophy, and tissue trauma can all impact the sense of taste.³²

Periodontitis and gingivitis. Studies are conflicting regarding periodontitis in patients with eating disorders.³⁵ A recent study did show that excessive tooth brushing, gingival recession, and gingivitis were more frequent in patients with eating disorders than in non-eating disorder patient controls.³⁵

How to help

Talk to families/providers! Here are some suggestions:

- Keep the tone of questions non-judgmental and caring: Has vomiting been a problem for you? Have you had any recent changes in your eating habits or in your weight? Have you ever been diagnosed with an eating disorder?

- If you have concerns about a possible eating disorder from your oral exam and questioning, refer families to their primary care medical provider for further evaluation.

- Do not feel that you need to make the eating disorder diagnosis, as diagnosis may take assessment by a multi-disciplinary team.

- Disordered eating behaviors are not issues protected by minor confidentiality laws, and it is important to bring concerns to the patient's and the parents' attention.

- The diagnosis and treatment of eating disorders involves a team approach — dentists should not hesitate to

contact the patient's other care providers, particularly the primary care team. Observations and recommendations from dental providers are valuable and appreciated. Multi-disciplinary communication is important for positive patient outcomes.

Post-vomiting recommendations:

■ Brushing teeth immediately after vomiting may contribute to enamel erosion, and so patients can instead rinse with water, followed by using a sodium fluoride rinse when possible.⁵ A water and sodium bicarbonate rinse may also be recommended after vomiting.³¹

■ Topical fluoride applied in the dental office or home use of prescription fluoride toothpaste can help prevent further enamel erosion.⁵

■ Advise patients to reduce sources of acid in the diet: acidic drinks, fresh fruits (especially citrus), and alcohol.

Management of salivary gland enlargement:

■ It can be helpful for patients to understand that there may be an increase in enlargement and some soreness of salivary glands a few days after cessation of vomiting. Anti-inflammatory medications such as ibuprofen, warm compresses, and sialogogues like tart candies can help with symptom management.³³

■ Prolonged cessation of both binge-eating and vomiting is the most important treatment for sialoadenosis.

In refractory cases, oral pilocarpine has been used to help reduce salivary gland enlargement.³³

Pre-procedure considerations:

■ If a patient with an active eating disorder requires anesthesia for a procedure or the post-procedure recovery will negatively impact eating, unless the care is necessary to address an emergent need or for pain control the procedure should be delayed until the patient is in a healthy weight range with stable vital signs and electrolytes.

Eating disorder treatment programs in Michigan:

■ Michigan Medicine Comprehensive Eating Disorders Program at C.S. Mott Children's Hospital/University of Michigan Health in Ann Arbor: <https://www.mottchildren.org/conditions-treatments/eatingdisorders>.

■ Hough Center for Adolescent Health at Beaumont in Troy: <https://www.beaumont.org/conditions/teen-eating-disorders>

■ Sanford Comprehensive Treatment for Eating Disorders in Grand Rapids: <https://sanfordhousegr.com/programs/eating-disorders/>

Other resources for families:

■ Books — *Help Your Teenager Beat an Eating Disorder*, 2nd edition, by James Lock and Daniel Le Grange, and *When Your Teen Has an Eating Disorder: Practical Strategies*

(Continued on Page 44)

Fig. 2 — Erosion on the palatal aspect of maxillary teeth.

(Figs. 2 and 3 courtesy of Journal of Family Medicine and Primary Care).³⁷



Fig. 3 — Bilateral parotid swelling in bulimia.³⁷



Pediatric Dentistry

(Continued from Page 43)

to *Help Your Teen Recover from Anorexia, Bulimia & Binge Eating*, by Lauren Muhlheim.

■ Websites for parents:

<https://www.feast-ed.org/>, and
<http://maudsleyparents.org/>.

In summary, the oral health care team should remain alert to the clinical signs of eating disorders, understanding the higher prevalence in adolescents during the COVID-19 pandemic, and be familiar with the potentially severe consequences of these disorders. The clinical signs seen in the dental office may provide clues for earlier diagnosis, referral, and treatment, all of which are important for long-term recovery. Oral health care providers are often the first contact for patients with eating disorders and can play a critical

The clinical signs seen in the dental office may provide clues for earlier diagnosis, referral, and treatment, all of which are important for long-term recovery.

role for these adolescents and their parents. ●

References

1. DeBate R, Tedesco L, Kerschbaum W. Knowledge of oral and physical manifestations of anorexia and bulimia nervosa among dentists and dental hygienists. *Journal of Dental Education* 2005;69:346-54.
2. Association AP. *Diagnostic and statistical manual of mental disorders*. 5th ed. United States: American Psychiatric Publishing; 2013.
3. Campbell K, Peebles R. Eating disorders in children and adolescents: state of the art review.

Pediatrics 2014;134(3):582-92.

4. Favaro A, Caregaro L, Tenconi E, Bosello R, Santonastaso P. Time trends in age at onset of anorexia nervosa and bulimia nervosa. *J Clin Psychiatry* 2009;70(12):1715-21.

5. Hornberger L, Lane M. Committee on Adolescence. Identification and management of eating disorders in children and adolescents. *Pediatrics* 2021;147(1).

6. Watson R, Adjei J, Saewyc E, et al. Trends and disparities in disordered eating among heterosexual and sexual minority adolescents. *Int J Eat Disord* 2017;50(1):22-31.

7. Griffiths S, Mond J, Murray S, et al. Young peoples's stigmatizing attitudes and beliefs about anorexia nervosa and muscle dysmorphia. *Int J Eat Disord* 2014;47(2):189-95.

8. Gorrell S, Murray S. Eating disorders in males. *Child Adolesc Psychiatric Clin N Am* 2019;28:641-51.

9. Hudson J, Hiripi E, Pope H, Kessler R. The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological Psychiatry* 2007;61(3):348-58.

10. Guerdjikova A, Mori N, Casuto L, McElroy S. Update on binge eating disorder. *Medical Clinics of North America* 2019;103(4):669-80.

11. Zimmerman J, Fisher M. Avoidant/restrictive food intake disorder (ARFID). *Curr Probl*



Males at risk too — Despite the common perception that eating disorders are limited to young females, they can also affect teenage boys.

Pediatr Adolesc Health Care 2017;47:95-103.

12. Trace S, Baker J, Peñas-Lledó E, Bulik C. The genetics of eating disorders. *Annu Rev Clin Psychol* 2013;9:589-620.

13. Colton P, Olmsted M, Daneman D, et al. Eating disorders in girls and women with type 1 diabetes: a longitudinal study of prevalence, onset, remission, and recurrence. *Diabetes Care* 2015;38(7):1212-17.

14. Neumark-Sztainer D, Wall M, Larson N, Eisenberg M, Loth K. Dieting and disordered eating behaviors from adolescence to young adulthood: findings from a 10-year longitudinal study. *J Am Diet Assoc* 2011;111(7):1004-11.

15. Mitchison D, Hay P. The epidemiology of eating disorders: genetic, environmental, and societal factors. *Clin Epidemiol* 2014;17(6):89-97.

16. Graell M, Morón-Nozaleda M, Camarero R, et al. Children and adolescents with eating disorders during COVID-19 confinement: difficulties and future challenges. *Eur Eat Disord Rev* 2020;28(6):864-70.

17. Schwartz M, Costello K. Eating disorder in teens during the COVID-19 pandemic. *J Adolesc Health* 2021;68(5):1022.

18. Otto A, Jary J, Sturza J, et al. Medical admissions among adolescents with eating disorders during the COVID-19 pandemic. *Pediatrics* 2021;148(4).

19. Smink F, van Hoeken D, Hoek H. Epidemiology of Eating Disorders: Incidence, Preevalence and Mortality Rates. *Curr Psychiatry Rep* 2012;14:406-14.

20. Harris E, Barraclough B. Excess mortality of mental disorder. *Br J Psychiatry* 1998;173:11-53.

21. Ackard D, Richter S, Egan A, Cronemeyer C. Poor outcome and death among youth, young adults, and midlife adults with eating disorders: an investigation of risk factors by age at assessment. *Int J Eat Disord* 2014;47(7):825-35.

22. Steinhausen H. Outcome of eating disorders. *Child Adolesc Psychiatr Clin N Am* 2009;18(1):225-42.

23. Rosen D. American Academy of Pediatrics Committee on Adolescence. Identification and management of eating disorders in children and adolescents. *Pediatrics* 2010;126(6):1240-53.

24. Rosten A, Newton T. The impact of bulimia nervosa on oral health: a review of the literature. *Br Dent J* 2017;223(7):533-39.

25. Casamassimo P, Fields H, McTigue D, Nowak A. *Pediatric dentistry: infancy through adolescence*. 5th ed. St. Louis, MO: Elsevier Saunders; 2012.

26. Kisely S, Baghaie H, Laloo R, Johnson N. Association between poor oral health and eating disorders: systematic review and meta-analysis. *The British Journal of Psychiatry* 2015;207:299-305.

27. Uhlen M, Tveit A, Refsholt Stenhagen K. Self-induced vomiting and dental erosion – a clinical study. *BMC Oral Health* 2014;14.

28. Conviser J, Risher S, Mitchell K. Oral care

behavior after purging in a sample of women with bulimia nervosa. *Journal of the American Dental Association* 2014;145(4):352-4.

29. Milosevic A, Slade P. The orodental status of anorexics and bulimics. *Br Dent J* 1989;167:66-70.

30. Milosevic A. Eating disorders and the dentist. *Br Dent J* 1999;186(3):109-13.

31. Nowak A, Casamassimo P. *The handbook of pediatric dentistry*. 4th ed. Chicago, IL: American Academy of Pediatric Dentistry; 2017.

32. Hasan S, Ahmed S, Panigrahi R, et al. Oral cavity and eating disorders: an insight to holistic health. *J Family Med Prim Care* 2020;9(8):3890-97.

33. Sachs K, Mehler P. Medical complications of bulimia nervosa and their treatments. *Eat Weight Disord* 2016;21(1):13-18.

34. Dean J, Avery D, McDonald R. *McDonald and Avery's dentistry for the child and adolescent*. 9th ed. St. Louis, MO: Elsevier

Saunders; 2011.

35. Pallier A, Karimova A, Boillot A, et al. Dental and periodontal health in adults with eating disorders: A case-control study. *J Dent* 2019;84:55-59.

36. Bonilla E, Del Aguila C, Wetzel D, Scott E, Bonilla S. Eating disorders: diagnosis and prosthodontic management. *BAOJ Dentistry*;3:037. At: https://www.researchgate.net/publication/321875444_Eating_Disorders_Disorders_Diagnosis_and_Prosthodontic_Management.

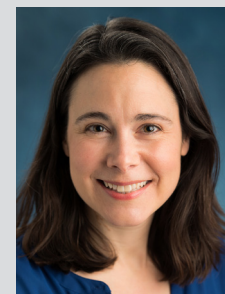
37. Hasan S, Ahmed S, Panigrahi R, Chaudhary P, Vyas V, Saeed S. Oral cavity and eating disorders: an insight to holistic health. *Journal of Family Medicine and Primary Care* 2020;9(8)3893. At: [JFMPC-9-3890.pdf](https://www.researchgate.net/publication/321875444_Eating_Disorders_Disorders_Diagnosis_and_Prosthodontic_Management) (nih.gov).

About the Authors

Catherine A. Miller, MD, is an assistant professor in the Division of Adolescent Medicine at the University of Michigan in Ann Arbor. She is the Adolescent Medicine Fellowship program director and splits her time between medical education for students, residents, and fellows and clinical care for adolescent and young adult patients. She provides clinical care in the Comprehensive Eating Disorders Program, the University Health Services Eating and Body Image Concerns Clinic, the Adolescent/Young Adult Clinic, and the Adolescent Medicine Inpatient Consult Service at C.S. Mott Children's Hospital. She has a special interest in the intersection of eating disorders and athletics and co-leads a multi-disciplinary Eating Disorders Task Force within the U-M Athletics Department.

James R. Boynton, DDS, MS, is clinical professor of dentistry, Pediatric Dentistry Division head, and director of the Pediatric Dentistry Residency Program at the University of Michigan School of Dentistry. He is involved in clinical care and education at the University of Michigan School of Dentistry and Mott Children's Hospital and maintains an active practice in Ann Arbor.

Terrill Bravender, MD, MPH, is the David S. Rosen, MD, Collegiate Professor of Adolescent Medicine, professor of pediatrics, and the division director of adolescent medicine at the University of Michigan in Ann Arbor, where he also holds an appointment as professor of psychiatry. He is the executive director of the Comprehensive Eating Disorders Program and co-medical director of the University of Michigan Adolescent Health Initiative.



Miller



Boynton



Bravender