

How to Incorporate Bariatric Training Into Your Fellowship Program

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Since 2013, obesity has been recognized by the American Medical Association as a chronic disease as opposed to a chronic condition to alert the medical community to be more active in addressing this epidemic.¹ In 2016, approximately 39.8% of US adults met the

criteria for obesity, defined as a body mass index of ≥ 30 kg/m², with an estimated cost of \$147 billion annually.² Given the relationship between obesity and the gastrointestinal tract, including gut hormones, nutrition, nonalcoholic fatty liver disease, and other obesity-related gastrointestinal disorders, as well as the emerging role of endoscopy as an effective treatment modality, gastroenterologists will continue to be more involved in the management of this disease.

In 2007, the Gastroenterology Core Curriculum was updated via a collaboration of the American Gastroenterological Association, the American College of Gastroenterology (ACG), the American Society for Gastrointestinal Endoscopy and the American Association for the Study of Liver Diseases. In this core curriculum, there are 17 chapters reflecting the essential topics to be covered by fellowship programs. Although obesity is not listed as a core chapter, it is mentioned within the training in nutrition chapter. Specifically, the document states that trainees should obtain a general understanding of obesity, including pathophysiology, comorbidities, weight management principles, and complications of bariatric surgery.³

As gastroenterologists become more active in the care of patients with obesity, fellowship programs should be ready to provide an intellectual environment for trainees to acquire the knowledge, skills, clinical judgment, and professional attributes that are essential to the practice of obesity medicine. This article addresses the process of incorporating bariatric training into gastroenterology fellowship programs. It is important to note that this article is based largely on expert opinion and is intended to start a discussion regarding the introduction of obesity and obesity management into gastroenterology fellowship programs as

Goals of Training

Bariatric training for gastroenterology fellows may be divided into 2 levels. Level 1 represents basic training in obesity medicine that should be provided to all trainees. Level 2 represents advanced training for fellows who are interested in specializing in obesity medicine and include those who plan on practicing obesity medicine with or without bariatric endoscopy.

Level 1

The fellowship programs should provide all trainees with a general understanding of the following topics.

Obesity and Its Pathophysiology. Trainees should understand the definition, classification, and social impact of obesity. The pathophysiology of obesity and its related comorbidities should be emphasized. Additionally, trainees should learn to recognize and manage gastrointestinal diseases that are more common in patients with obesity.

Principles of Obesity Management. Trainees should develop a basic understanding of lifestyle modification, pharmacotherapy, and endoscopic and surgical interventions for the treatment of obesity and its comorbidities, and should know when to appropriately refer patients for each treatment modality. The importance of an interdisciplinary team strategy should also be emphasized.

Endoscopy in Patients with Obesity with or without Previous Bariatric Surgery. Trainees should understand challenges related to sedation and airway management in patients with obesity. Goals of endoscopy before bariatric surgery should also be emphasized. Additionally, they should understand and be able to recognize surgical anatomy for bariatric procedures and be able to diagnose and manage common complications.

Ethics and Professionalism. Trainees should learn to be mindful of obesity-related psychosocial issues and be able to obtain weight-related history in a neutral and

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nonstigmatizing way. Careful attention should be given to selecting and using weight-friendly equipment.

Level 2

Level 2 trainees should achieve all level 1 goals in addition to the following.

Comprehensive Medical Evaluation for Patients with Obesity. Trainees should be able to obtain a complete weight-related history and physical examination. They should also be competent in the evaluation of secondary causes of obesity and related nutritional deficiencies. Additionally, they should be capable of performing a thorough prebariatric surgical evaluation, including preoperative endoscopy as indicated.

Competence in Lifestyle and Medical Management of Obesity. Trainees should be able to advise patients on specific diet plans and exercise programs with appropriate intensity. Eating disorders and relevant psychiatric conditions should also be addressed. Trainees should be familiar with medications that promote weight gain and know alternative medications to suggest to the prescribing physicians. Comprehensive knowledge of and ability to prescribe weight loss medications (US Food and Drug Administration–approved and off label) should also be achieved.

Understanding the Cognitive Aspects of and Achieving Technical Proficiency in Endoscopic Bariatric and Metabolic Therapies. Trainees should have a comprehensive understanding of the US Food and Drug Administration–approved and investigational endoscopic bariatric and metabolic therapies (EBMTs). Patient selection, risk–benefit profile, adverse events and their management should also be emphasized. Additionally, the sedation plan, preprocedural assessment, and post-procedural instructions should be a part of the bariatric curriculum. Furthermore, programs may offer a variety of procedures, including various primary EBMTs and specific complication management techniques. If a program does not perform a certain class of procedure, access to relevant content experts should be arranged.

American Boards of Obesity Medicine Certification. For level 2 trainees who plan on subspecializing in bariatrics, programs should be prepared to provide a path that allows them to become board certified in obesity medicine. As of 2018, there are 54 gastroenterologists who are board certified in obesity medicine, representing 2% of all ABOM diplomates. This number is however expected to increase.

Training Process

Bariatric training in gastroenterology fellowship can take a variety of forms. Various models and resources will likely be required to achieve these goals. [Tables 1 and 2](#) illustrate the suggested bariatric content for the gastroenterology core curriculum, and the levels 1 and 2 sections detail a proposal for delivery of this content.

Level 1

Didactic Lectures and Selected Readings. To obtain the core knowledge required for all trainees, didactic

lectures and selected readings should be integrated as part of the fellowship curriculum. At institutions where experts in obesity medicine, bariatric endoscopy, or bariatric surgery are available, these lectures should be given by the experts and topics should include the medical, endoscopic, and surgical management of obesity. Additionally, several readings and guidelines on obesity medicine are available and should be included as part of training.^{4–10}

Online Training Modules. Fellows can acquire additional knowledge in bariatric medicine through online training modules. For institutions that are able to provide a comprehensive curriculum through didactic lectures, this training model may be optional. Additionally, these modules may be selectively implemented depending on available resources at individual programs. Current online training modules include the Obesity Medicine Academy which is the academy's online learning platform including >200 on-demand presentations related to obesity medicine, and various American Society for Gastrointestinal Endoscopy training videos.

Clinical Shadowing Experience. All trainees should have clinical exposure to all areas listed. These clinical experiences can be obtained by rotating on inpatient and outpatient nutrition and bariatric surgery services. Clinical shadowing in a weight loss clinic and a bariatric endoscopy clinic (if available) should also be offered. For institutions that have bariatric endoscopists, an endoscopy rotation to expose trainees to postbariatric surgery anatomy and endoscopic management of complications should be provided.

Level 2

Level 2 training should be obtained at institutions where faculty have expertise in obesity medicine and bariatric endoscopy if available. Achievement of competence in level 2 training requires an average of 12 months of clinical and research training in obesity medicine, which can be provided either as a separate fourth-year fellowship or as part of the third-year gastroenterology fellowship for certain programs. In addition to the listed teaching materials required for level 1 trainees, level 2 trainees should be exposed to the following.

Interdisciplinary Conference. An interdisciplinary case conference focusing on bariatrics should be available at the institutions that provide level 2 training. Experts from various disciplines including nutrition, social worker, psychology, endocrinology, gastroenterology and surgery should be part of the conference. Fellows should participate by presenting interesting cases, as well as landmark and recently published articles and research projects.

Clinical Rotations. Level 2 trainees should have an opportunity to rotate through several subspecialty clinics, including nutrition, lifestyle coaching, obesity medicine, bariatric endoscopy, and bariatric surgery. This training may be done concurrently or sequentially. Trainees should actively participate during these rotations with a goal of being able to independently provide counseling on lifestyle intervention, prescribing weight loss medications, and performing procedures by the time of graduation. A few

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Table 1. Suggested Obesity-Related Gastroenterology Core Curriculum Content

Topics	Subtopics for Level 1 and 2 Trainees	Additional Subtopics: For Level 2 Trainees
Obesity and determinants of obesity	Definition, prevalence and severity of obesity Genetic, environmental and cultural factors of obesity Financial burden and psychosocial aspects of obesity GI-related obesity comorbidity management Professionalism issues related to obesity	Complete obesity-related medical history and physical examination Appropriate selection of blood work, radiologic tests and other assessments to identify genetic predilection or secondary causes of obesity Management of general obesity comorbidities Motivational interviewing strategies
Obesity pathophysiology	Central nervous system and peripheral gut hormones that control energy balance and weight regulation Orexigenic and anorexigenic effects of these hormones Body fat types and the effect of their distribution	Genetic obesity disorders and their mechanisms Microbial and bile acid alterations and their effect on weight regulation
Nutrition	Macronutrient and micronutrient, associated calories and site/mechanism of absorption along GI tract Obesity-related vitamin and mineral homeostasis including calcium, parathyroid hormone, vitamin B ₁₂ , and vitamin D	Nutrition-related assessment and dietary recall Evidence-based dietary interventions, including very low calorie diets, protein-sparing modified fast, low calorie diets, low carbohydrate diets, low energy density diets and meal replacements Commercial diet plans, such as Weight Watchers, Jenny Craig, Nutrisystem, South Beach, Zone, DASH, HMR, Atkins, Mediterranean, Ornish, and their effects on weight loss and comorbidities
Physical activity	Energy expenditure concepts including resting metabolic rate, diet-induced thermogenesis and physical activity-related energy expenditure (exercise and non-exercise activity thermogenesis) Muscle anatomy and exercise physiology	Physical activity-related history taking Guidelines on physical activity for weight loss and weight loss maintenance Intensive lifestyle intervention and landmark studies including the Look AHEAD and the Diabetes Prevention Program studies
Pharmacotherapy	Mechanisms of action, indications, contraindications and adverse events of FDA-approved weight loss medications (Table 2)	Comprehensive obesity-related medication history Dosing and frequency, stopping rules, drug-drug interactions and insurance coverage of weight loss medications Off label usage and over-the-counter medications Management of drug-induced weight gain
Bariatric endoscopy	Relevant endoscopic history and sedation evaluation Pre-bariatric surgery endoscopic evaluation Endoscopic management of common bariatric surgical complications Indications, contraindications, criteria for referral, efficacy and adverse events of FDA-approved EBMTs and the effects on comorbidities (Table 2)	Patient selection, mechanisms of action, preprocedural and postprocedural care, technical procedure details and management of major and minor adverse events for available EBMTs Hands-on technical instruction regarding EMBT performance and advanced complication management
Bariatric surgery	Anatomy, physiology and possible mechanisms of action of common bariatric surgeries Indications, contraindications, criteria for referral, efficacy and adverse events of bariatric surgery and the effects on comorbidities Complications of bariatric surgeries and their medical and endoscopic treatment options (Table 2)	Comprehensive medical management of bariatric surgical complications

Abbreviations: EBMTs, endoscopic bariatric and metabolic therapies; FDA, US Food and Drug Administration; GI, gastrointestinal.

sessions to observe bariatric surgery should also be considered to further enhance trainees' understanding of anatomy and surgical technique.

Endoscopy Rotations. Trainees should start by learning principles of diagnostic endoscopy in patients with

obesity and those with previous bariatric surgery, including the diagnosis of marginal ulceration, fistulas, and stenosis. Simple therapeutic procedures such as argon plasma coagulation for the treatment of weight regain and balloon dilation of stenosis may then be considered. Next, trainees

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Table 2. Currently available obesity medications, primary EBMTs, and complications of bariatric surgery^a

Topics	Suggested Content	
Pharmacotherapy	FDA-approved medications Phentermine Orlistat (Xenical) Phentermine/Topiramate ER (Qsymia) Lorcaserin (Belviq) Naltrexone SR/Bupropion SR (Contrave) Liraglutide (Saxenda)	Investigational medications Metformin Methylphenidate Other GLP-1 analogues SGLT-2 inhibitors MC4R agonist Combination therapies
Primary EBMTs	FDA-Approved EBMTs Gastric Interventions Orbera Gastric Balloon ReShape Integrated Dual Balloon System Obalon Balloon System Gastric plication as used for primary obesity surgery endoluminal Gastric suturing as used for endoscopic sutured/sleeve gastropasty (ESG) Aspiration therapy Small bowel interventions None	Investigational EBMTs Gastric interventions Spatz3 adjustable balloon system Eclipse balloon Transpyloric shuttle Small bowel interventions Duodenal-jejunal bypass liner Duodenal mucosal resurfacing Gastroduodenal-jejunal bypass Magnetic anastomosis
Complications of bariatric surgery	Roux-en-Y gastric bypass Surgical leaks Marginal ulceration Gastrojejunal anastomotic stenosis Gastrogastric fistula Intestinal obstruction Cholelithiasis Weight regain Sleeve gastrectomy (SG) Sleeve leaks Sleeve stenosis Reflux and its complications Weight regain	Laparoscopic adjustable gastric band Reflux esophagitis Esophageal dilatation Band erosion Band slippage Vertical banded gastropasty Anastomotic stenosis Band erosion Staple line dehiscence

Abbreviations: EBMTs, endoscopic bariatric and metabolic therapies; FDA, US Food and Drug Administration.

^aSuggested for incorporation into gastroenterology fellowship curricula as of January 2019. This content should be updated as appropriate.

may progress to less complex primary EBMTs, such as aspiration therapy and intragastric balloons. Before learning more complex procedures including endoscopic suturing and plication, trainees should learn to assist and become comfortable with the devices, accessories, and steps involved in each procedure.

Hands-on Simulator Training. Hands-on simulator training should be highly considered for a subset of level 2 trainees who aspire to perform bariatric endoscopy in clinical practice. This includes mechanical and ex vivo simulators developed primarily for training of more complex procedures such as endoscopic suturing and plication. Company- and device-specific simulators are also becoming available. It is recommended that trainees learn and practice using the device and accessories in the simulator before initiation of their first human case.

Courses Outside Institution. There are several courses that focus on obesity medicine with a few focusing primarily on bariatric endoscopy with hands-on and/or live case demonstration.¹¹ Additionally, an increasing number of interventional endoscopy courses have started to

incorporate a day of bariatric endoscopy training which includes both didactic lectures and hands-on session.

Externship at Bariatric Center of Excellence. For programs that lack expertise in any of these areas, trainees should be encouraged to do externship rotations to achieve comprehensive training. These externship rotations may also be structured to count toward the 18-month clinical Accreditation Council for Graduate Medical Education (ACGME) requirement.

Obesity Medicine and/or Bariatric Endoscopy Fellowship. Currently, there are several obesity medicine fellowship programs, all of which require completion of an ACGME-accredited residency program and range from 1 to 3 years. Additionally, trainees may choose to pursue a 1-year bariatric endoscopy fellowship. These programs typically take fourth-year fellows; however, training may also be accomplished within select 3-year gastroenterology fellowship program. Additionally, many fourth-year advanced endoscopy fellowships are increasingly, including bariatric endoscopy as part of their curricula. However, with many diverse objectives these programs often do not have time to

incorporate a comprehensive interdisciplinary structure that is critical to learning obesity medicine.

ABOM Certification. There are currently 2 pathways for trainees to become board eligible for ABOM examination. First, trainees may spend >500 hours (equivalent to 2.5 full-time months) on clinical rotations managing patients with obesity and/or obesity-related conditions. Second, they may earn 60 continuing medical education credits with 30 credits being earned from attending one of the following conferences—Obesity Medicine Association Spring Conference, Columbia University/Weil Cornell Obesity Conference, Harvard Blackburn Course in Obesity Medicine, Obesity Medicine Association Fall Conference and Obesity Week—and the remainder 30 credits from participating in home-based continuing medical education activities or live meetings where obesity is the specific educational focus.

Assessment of Competence

Knowledge of obesity medicine and bariatric endoscopy should be assessed as part of the overall evaluation of trainees in gastroenterology during and after the fellowship. Questions relating to obesity medicine and bariatric endoscopy should be included on the gastroenterology board examination and should reflect a general knowledge of this content. Assessment of competency for level 2 goals may be more appropriately achieved through non-ACGME pathways including ABOM certification and programs being put forth by Society of American Gastrointestinal and Endoscopic Surgeons and the ABE.

Conclusions

As the obesity pandemic continues to worsen, impacting all aspects of medicine and society, medical professionals across various specialties are encountering this patient population in different ways and with increasing frequency. An interdisciplinary approach is critical to the management of this disease and gastroenterologists must now take a more active role in the care of these patients. Evolution in gastroenterology training is essential to better prepare fellows for future clinical practice. This document provides proposed objectives, curriculum content, training models, available resources and assessment of competence for obesity medicine and endoscopy training within gastroenterology fellowship programs.

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Conflicts of interest

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