

Launching a new fellowship: Bariatric Anesthesia

ABSTRACT

The dream is now real! We had started thinking of establishing “Bariatric Anesthesia Fellowship” (BAF) program in our setting since 2012. The reason was the increasing number of bariatric surgical cases for weight loss under general anesthesia (GA). The journey till establishing the BAF program consisted of two phases. Phase I started in 2012 to establish clinical practice guidelines (CPG) in “Anesthesia for Patients with Morbid Obesity undergoing weight loss surgery”. Phase II started in 2015 to establish BAF program. In 2021 the first draft of BAF program was submitted to the medical education for approval. In March 2022, we got the interim approval of the program. Though the journey took sometime but ultimately it ended with success and achieving the dream. In this review, we are going to discuss a roadmap consisted of two phases in an attempt to reach our goal of establishing the BAF program.

Key words: Anesthesia, bariatric surgery, fellowship program


Introduction

The dream is now real! We had started thinking of establishing “Bariatric Anesthesia Fellowship” (BAF) program in our setting since 2012. The reason was the increasing number of bariatric surgical cases for weight loss under general anesthesia (GA). The journey till establishing the BAF program consisted of two phases. Phase I started in 2012 with clinical practice guidelines (CPG) in “Anesthesia for Patients with Obesity undergoing weight loss surgery”. Phase II started in 2015 to establish the BAF program. Though the journey took sometime but ultimately it ended with success and achieving the dream. In this review, we are going to discuss a roadmap which was in two phases to establish the BAF program.

Roadmap Phases to Establish the BAF Program

Phase I: CPG “anesthesia for patients with obesity undergoing weight loss surgery”

In 2012, we formed a committee to represent the department of anesthesia in the College of Medicine, clinical practice guidelines (CPG) committee. We have attended several meetings with the members of CPG committee in an attempt to establish guidelines for different subspecialties in the college for different subjects of interest. In one of the meetings, they requested us to select a topic to work with and establish CPG for. We have decided to work on establishing CPG in “Anesthesia for Patients with Obesity undergoing weight loss surgery”. In order to accomplish CPGs for a specific topic, the proposal has to pass into three phases: Set-up, adaptation, and finalization phases. Set-up

Access this article online	
Website: www.saudija.org	Quick Response Code 
DOI: 10.4103/sja.sja_311_22	

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Eldawlatly AA. Launching a new fellowship: Bariatric anesthesia. Saudi J Anaesth 2022;16:278-86.

ABDELAZEEM A. ELDAWLATLY

Department of Anesthesia, College of Medicine, King Saud University, Riyadh, KSA

Address for correspondence: Prof. Abdelazeem A. Eldawlatly, Department of Anesthesia, College of Medicine, King Saud University, Riyadh, Saudi Arabia.

E-mail: dawlatly2@yahoo.com

Submitted: 15-Apr-2022, **Revised:** 16-Apr-2022, **Accepted:** 16-Apr-2022, **Published:** 20-Jun-2022

phase which includes six steps as follow: Step 1: Feasibility of adaptation, Step 2: Establishment of an organizing committee and subcommittee, Step 3: Selection of the topic, Step 4: Identification of the necessary resources and skills, Step 5: Completion of setup tasks, and Step 6: Writing an adaptation plan. Adaptation phase is an essential part of establishing CPG. The adaptation process usually starts by defining the clinical question for which the CPGs are to be established. In our case, the clinical question was, “What are the best practice recommendations for anesthetic, perioperative care and pain management in patients with obesity undergoing weight loss surgery?” In order to define the health question, the PIPOH tool was used as follows: • Population – The population concerned are the patients with obesity undergoing weight loss surgery • Intervention – The intervention included anesthetic, perioperative management as well as postoperative pain control • Professionals – All the anesthetists as well as the technicians and nurses working in the theater are the targeted professionals • Outcome – Expected to decrease practice variation and reduce perioperative morbidity • Health care setting – Is the operation theater and immediate postoperative care areas where the guideline will be applicable.^[1] The next step after identifying the clinical question was to search for the topic in the English language literature between 2005 and 2011. A comprehensive search for guidelines was done. We searched US National Guidelines Clearing House (NGCH), Guidelines International Network (GIN), PubMed, and Google Scholar. We have identified three guidelines near to our clinical search.

Guideline 1 title: Perioperative management of morbidly obese patient. This was developed by the Association of Anesthetists of Great Britain and Ireland.^[2] The date of research was not mentioned, but the references supplied indicated that the search period was from 2001 to 2006. Unfortunately, these guidelines did not fulfill the clinical need of the topic under discussion. **Guideline 2 title:** Anesthetic considerations and management of patients with obesity presenting for bariatric surgery. This was developed by the Department of Anesthesia, Beaumont Hospital Dublin, Ireland, by Tanya O’Neil and Joanna Allam.^[3] The search period was from 2001 to 2009 with no recommendations separately mentioned either as tables or appendixes. **Guideline 3 title:** Best practice recommendations for anesthetic perioperative care and pain management in weight loss surgery (WLS). This was developed by Roman Schumann *et al.*^[4,5] They developed these guidelines within a comprehensive review of the topic for the State of Massachusetts in the USA with intended broad applicability beyond just an individual institution in 2005 and updated in 2009. The recommendations were

published in the English language in the United States of America. The recommendations of this work have met most of the requirements for anesthetic, perioperative care and pain management in WLS. The above three guidelines underwent assessment via AGREE II instrument where guideline 3 scored the highest percentage. Appraisal of Guidelines for Research and Evaluation (AGREE II) is the most well-developed instrument.^[6] The next step was to adapt it. We have contacted the lead author of that practice recommendation and obtained his approval regarding its adaptation in our setting. In 2015, we finally issued the final version of the CPG. Phase I has led to an established CPG for anesthesia in patients with obesity undergoing WLS. We have considered this CPG the first step forward in the journey to establish bariatric anesthesia fellowship program as we are going to discuss in phase II.

Phase II: Bariatric anesthesia fellowship (BAF) program

Bariatric anesthesia is one of the growing sub-specialty in anesthesia. Bariatric surgical procedures in Saudi Arabia and especially in Riyadh region became the leading surgical procedure performed in our setting. Cooperation between anesthesia and surgical teams plays a determinant factor for the bariatric surgery patient’s outcome. This level of cooperation requires the anesthetist to master the anesthetic techniques performed for the surgical procedures and to know in depth respiratory physiology, pharmacology and patient’s preoperative risk assessment and optimization of the patient condition as well as patient education preoperatively. It is important to understand the mechanisms of obstructive sleep apnea (OSA) among those patients and start the required respiratory therapy preoperatively. For most of the procedures protective lung ventilation strategy is preferable, requiring the knowledge of its technique, management and complications. Airway management is another important aspect in bariatric anesthesia. Awake fiberoptic intubation and use of video-laryngoscopy are among the leading techniques that the fellow will learn during BAF program. Bariatric anesthesia also permits the fellow to perform specific procedures, such as opioid free/sparing anesthesia and ultrasound truncal blocks, namely transversus abdominis plane/rectus sheath/erector spinae plane (TAP/RS/ESP) blocks.^[7] The early postoperative management of these patients can be complex, requiring full knowledge of the possible complications, mainly ventilatory, circulatory, and acute pain management. Implementation of Enhanced Recovery After Surgery/Anesthesia (ERAS/ERAA) guidelines protocols became now mandatory for patients with obesity undergoing WLS.^[8]

The first draft of the BAF program was submitted to the board review in the College of Medicine, King Saud Medical

City (KSMC) in January 2021. In the meantime, we looked for affiliation of our program to an international society. We have contacted the International Society of Perioperative Care of patients with Obesity (ISPCOP, <https://www.ispcop.net/>) looking for mutual cooperation. We have got a positive answer with the following offer: a) all faculty of the program will become members of ISPCOP, b) complimentary fellowship certificate will be awarded to the fellows in the program, c) The fellow collaborates with one of board members for research proposal (R Schumann, P Ziemann-Gimmel, A Sultana, A Eldawlatly, S N. Kothari, S Shah, A Wadhwa). Further support to our proposal obtained in July 2019, our department was accredited a Centre of Excellence certificate by the Surgical Review Corporation (SRC). That was a milestone recognition of our setting standard of care and personnel to deal with patients with obesity undergoing WLS. In March 2022, we have got interim approval from the medical education to our BAF program (the full BAF program is available as Appendix 1 at the end of this review). That was ever the best news received this year. That mean we are going to receive applications in September and the first fellow will start on January 2023. An important aspect of our BAF program is the research. Actually, we published few articles on anesthesia for patients with obesity underwent WLS. We have studied before the hemodynamic changes and respiratory mechanics of pneumoperitoneum in patients with obesity for bariatric surgery.^[9,10] Recently together with members of ISPCOP we have published a position statement on prophylaxis of postoperative nausea and vomiting (PONV) in bariatric surgery.^[11] We believe more research is waiting for our fellows to launch. There are many areas of research interests in the perioperative care of obese patients undergoing WLS. There is good opportunity for the fellows to conduct novel research with all available supportive resources in our setting.

Conclusion

The BAF program offers career development opportunities, provides experiential training, and can be used to recruit personnel to address specific challenges facing the public health workforce in the field of perioperative care of patients with obesity undergoing WLS. Due to increasing number of subjects undergoing bariatric surgery, we must prepare our

health specialists to master bariatric anesthesia. We hope the BAF program paves the way toward achieving this goal for better patient outcome.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Eldawlatly A, Qureshi S, Schumann R. "ROAD MAP" toward establishing clinical practice guidelines for anesthesia in morbidly obese patients undergoing weight loss surgery. *Saudi J Anaesth* 2012;6:319-21.
2. PeriOperative management of the morbidly obese patient. London W1B 1PY: The Association of Anaesthetists of Great Britain and Ireland, 21 Portland Place, 2007. Available from: www.aagbi.org/. [Last accessed on 2007 Mar].
3. O'Neill T, Allam J. Anesthetic considerations and management of the obese patient presenting for bariatric surgery. *Curr Anaesth Crit Care* 2010;21:16-23.
4. Schumann R, Jones SB, Ortiz VE, Connor K, Pulai I, Ozawa ET, *et al*. Best practice recommendations for anesthetic perioperative care and pain management in weight loss surgery. *Obes Res* 2005;13:254-66.
5. Schumann R, Jones SB, Cooper B, Kelley SD, Bosch MV, Ortiz VE, *et al*. Update on best practice recommendations for anesthetic perioperative care and pain management in weight loss surgery, 2004-2007. *Obesity (Silver Spring)* 2009;17:889-94.
6. National Collaborating Centre for Methods and Tools. Critically appraising practice guidelines: The AGREE II instrument. Hamilton, ON: McMaster University; 2011. Available from: <http://www.nccmt.ca/registry/view/eng/100.html>. [Last accessed on 2011 Nov 28].
7. El-Dawlatly A, Turkistani A, Kettner SC, Machata AM, Delvi MB, Thallaj A, *et al*. Ultrasound-guided transversus abdominis plane block: description of a new technique and comparison with conventional systemic analgesia during laparoscopic cholecystectomy. *Brit J Anesth* 2009;102:763-7.
8. Eldawlatly A. Is enhanced recovery after anesthesia a synonym to enhanced recovery after surgery? *Saudi J Anaesth* 2016;10:119-20.
9. El-Dawlatly A, Mansour E, Al-Shaer A, Al-Dohayan A, Samarkandi A, Abdulkarim A, *et al*. Impedance cardiography: Noninvasive assessment of hemodynamics and thoracic fluid content during bariatric surgery. *Obes Surg* 2005;15:655-8.
10. El-Dawlatly A, Al-Dohayan A, Abdel-Meguid ME, El-Bakry A, Manaa EM. The effects of pneumoperitoneum on respiratory mechanics during general anesthesia for bariatric surgery. *Obes Surg* 2004;14:212-5.
11. Schumann R, Ziemann-Gimmel P, Sultana A, Eldawlatly AA, Kothari SN, Shah S, *et al*. Postoperative nausea and vomiting in bariatric surgery: A position statement endorsed by the ASMBS and the ISPCOP. *Surg Obes Relat Dis* 2021;17:1829-33.

Appendix 1

Name of the Program

King Saud University Medical City Bariatric Anesthesia Fellowship (KSUMC-BAF).

Sponsoring Department: Department of Anesthesia, College of Medicine, KSUMC.

II. Fellowship Goals and Objectives

This fellowship will be a competency-based training. CanMEDs roles will be utilized to structure the objectives of the training.

It is expected at the end of the fellowship that the candidate shows full proficiency in these areas:

- Establishing central IV access using different approaches and inserting arterial line.
- Opioid free/sparing anesthesia protocols (alpha 2 receptor agonist, IV lidocaine infusion).
- Protective lung ventilation strategy.
- Formulate a plan for anesthetic management which anticipates potential problems that may occur intraoperatively. The fellow is expected to have a plan of management for problems should they occur.
- More involvement in the postoperative assessment and management of the patient is expected at the senior level.
- Understand and apply Enhanced Recovery After Surgery (ERAS) guidelines.
- To actively involve the Fellow in medical students and residents teaching.

III. Eligibility and Admission Criteria

Candidates must meet the following requirements:

- Medical Degree.
- Saudi Board-certified in anesthesia or equivalent degrees. Other credentials will be considered on a case-by-case basis.
- BLS and ACLS certified
- Full-time commitment to the program, during a two-year period.
- A letter of release and sponsorship from his base hospital for the complete period of training.
- Three referee's recommendation letters.
- Pass successfully the interview.

Degree Requirements

- MBBS
- Saudi Board-certified in anesthesia or equivalent degrees.

Duration of the program

The fellowship is for **24 months** (2 years).

Number of Positions

The program will accept one (1) Fellow/year.

Place of Training

King Khalid University Hospital.

Program Rotations

The program will run for **two years**, divided as follow:

- Bariatric anesthesia (17 months)
- Bariatric surgery (1 month)
- Pulmonary medicine/sleep disorder suite (1 month)
- Pulmonary laboratory (PFTs) (1 month)
- Regional anesthesia including ultrasound techniques (1 month)
- Nutrition department (1 month).

- Echocardiography laboratory (1 month)
- ICU (1 month).

Bariatric surgery rotation proposal

- A. Ward round/daily 7:30-9:00 AM
- B. Journal club on Sunday 12:30-13:30
- C. Full days OR, Tuesday-Thursday
- D. Outpatient clinic, Monday 10:00-15:00.

By the end of surgery rotation the candidate will **master**:

- Examining the patient preoperatively
- Selecting the patient for surgery
- Understand different surgical techniques and its indications
- Postoperative assessment and managing complications.

Pulmonary medicine/sleep disorder suite rotation proposal

- A. Ward round/daily 7:30-9:00 AM
- B. Journal club on Sunday 12:30-13:30
- C. Examination of patients with differential diagnosis
- D. Attending awake bronchoscopy in the endoscopy unit
- E. Performing 10 awake bronchoscopy under supervision
- F. Performing 10 awake bronchoscopy independently.
- G. Identify patients with obstructive sleep apnea/diagnosis and ventilatory support.

Pulmonary laboratory (PFTs) rotation proposal

- A. Examination of patients scheduled for spirometry
- B. Attending spirometry test
- C. Performing spirometry for 5 patients under supervision
- D. Performing spirometry test for 10 patients independently
- E. Interpretation of the spirometry results and writing the report.

Regional anesthesia/US-guided techniques rotation proposal

- A. Attending daily in the block room from 08:00 till 04:30 PM
- B. Performing combined spinal/epidural technique
- C. Learning knobology of US machine
- D. Performing US-guided blockade (upper/lower limbs/truncal blocks) under supervision. With emphasis on TAP and RS blocks
- E. Teaching US-guided paravertebral block technique
- F. Performing US-guided central venous and arterial cannulation.

Echocardiography laboratory rotation proposal

- A. Attending in the echo lab from 08:00-04:30 PM daily
- B. Preparation of patients for echocardiography
- C. Performing 10 procedures under supervision
- D. Performing 10 procedures independently
- E. Reporting and interpretation.

ICU rotation proposal

- A. Attending the daily morning/evening clinical round
- B. Learning different ventilation strategies in ICU patients
- C. Mastering sepsis campaign protocols
- D. Mastering use of invasive and noninvasive monitoring
- E. Attending MM meetings

Fellow Evaluation

- a A log book which details the procedures the fellow has either done by him/herself or assisted in the log book should be evaluated by the supervising consultant on monthly basis. The log book presents 20% of the evaluation process.
- b The fellow is evaluated at the end of every 4 months using evaluation form (provided). The evaluation process will be done by the supervising consultant on each rotation and presents 80% of the evaluation process.

Promotion

The Fellow will be promoted from 1st to the second year based on peer evaluation referees score >80%.

Equivalence of the Program to other Degrees

At the end of the two years the candidate will obtain a fellowship certificate in Bariatric Anesthesia. The promotion criteria are as per King Saud University policy and procedure. **AS PER SCHOLARY**

Structure and Contents

1. Program outlines

The program is a two years clinical training in Bariatric Anesthesia. The fellow will be allowed 30 days vacation leave/year, only one (1) Eid holiday/year.

The fellow will be committed to the following duties:

- The fellow is expected to work five days per week, and part of this time may be spent on nonclinical activities (research/teaching). The most typical working day will be from 07:30 AM to 16:30, there will be 3-5 night on calls/month (in house calls).
- The fellow will be responsible for the preoperative assessment, perioperative care and the immediate postoperative care at the PACU and give support to the postoperative care provided at the ICU suite, particularly issues concerning acute pain management.

2. Program – Theory & Practice.

Anatomy and Physiology

1. Anatomy and innervations of the upper and lower airway
2. Physiology of Obesity
3. Basic interpretation of chest X-ray, PA and lateral and of chest CT
4. Lung distribution of ventilation and perfusion and their determinants
5. Respiratory mechanics: compliance and resistance of the respiratory system and its components (lung tissue and chest wall), surface tension (La Place's Law, role of surfactant) and time constants of the alveolar units
6. Dead space (anatomic, physiologic, Bohr's equation) and shunt, factors affecting both.
7. Control of ventilation (chemoreceptor, central and peripheral)
8. Oxygen and carbon dioxide transport – oxy-hemoglobin dissociation curve (shape, P50, variables affecting)
9. Hypoxic pulmonary vasoconstriction (mechanism, limits, factors affecting)
10. Flow volume loops (normal and pathologic) - dynamic hyperinflation Oxygen toxicity (limits, mechanisms, "hypoxic drive")
11. Respiratory muscle mechanics (diaphragm, intercostals, accessory, effect of preoperative conditioning)
12. Modalities of mechanical ventilation
13. Obstructive sleep apnea physiology

Pharmacology

1. Premedication - benzodiazepines (effect on respiration)
2. Induction agents & opioids (effect on respiration, CO₂ response curve, chemoreceptor)
3. Bronchodilators - (beta 2 agonists & anticholinergics) mechanism of action, drugs, doses, side effects
4. Steroids: mechanism of action, drugs, administration & doses, side effects
5. Phosphodiesterase inhibitors (aminone, theophylline): mechanism of action, indications, doses, side effects
6. Mucolytics (N acetyl cysteine): mechanism of action, indications, doses, side effects
7. TAP/RS blocks: mechanism of action, agents, doses, side and toxic effects

8. Perioperative intravascular replacement and hemodynamic control
9. Different types of nutritional support.

Preoperative Assessment

1. Chest X-ray, CT, MRI
2. Pulmonary function testing (spirometry, MMEFR, DLCO, flow volume loops, split lung function tests, and risk assessment)
3. Arterial blood gases (ABGs). Blood workout and coagulation studies (INR/PTT)
4. Cardiac assessment (e.g. echo, stress testing, angiography Persantine-thallium, PA data) and exercise testing
5. Risk stratification/optimization of patient condition/education
6. ERAS guidelines
7. Polysomnography (rotation in sleep disorder unit)

Technical Skills

1. Placement of IV and arterial lines
2. Difficult intubation skill with VLS and FOB
3. Positioning of morbid obese patients for tracheal intubation with potential complications
4. Indicating and securing a central venous access via internal jugular and subclavian approaches using sterile technique.
5. Placement of US-Guided TAP/RS/ESPB blocks
6. Criteria for extubating the trachea in OR at completion of surgery.
7. Opioid free anesthesia protocols
8. ERAS/ERAA protocols
9. Direct observation of practical skills sessions (DOPS)

Disease States

Fellow must be able to discuss the common diseases found in morbid obese surgical patients. Stress must be made in the assessment of the risk factors for postoperative respiratory cardiovascular complications and outcome.

A list of the most important entities is:

1. Obstructive sleep apnea (OSA)
2. Gastroesophageal reflux disease (GERD)

Anesthesia Techniques

Fellow must be able to indicate and manage a safe anesthetic technique for morbid obese patients in terms of difficult airway, positioning, opioid free anesthesia protocols and ERAS guidelines also the following issues:

1. Preoperative co morbidities & current drug therapies
2. Monitoring required
3. Securing the airway
4. Patient positioning (Ramp)
5. Drugs to be used and potential intra-operative complications
6. Extubation and recovery. The fellow shall concentrate attention to the following issues:
 - a. Co-existing diseases and preoperative medications
 - b. Risk assessment and level of monitoring to be used
 - c. TAP/RS/ESPB blocks
 - d. Postoperative pain, circulatory complications and ventilatory management

I. Clinical Activities

The Bariatric surgery unit at KKHU performs an average of 20 surgical procedures each week for morbid obese patients. It is expected that by the end of the fellowship, the fellow would have performed anesthesia for those patients with competence.

Didactic Activities

- Fellows are expected to attend and supervise preoperative assessment.
- Perioperative discussions with the attending consultant.
- Pre-announced lectures discussing essential concepts in Bariatric Anesthesia, according to the Department of Anesthesia's schedule.
- The fellow will be asked to perform research in the field and collect data supervised by the attending consultant and by senior member from the ISPCOP.
- Attending Sunday journal club meeting.
- Attending the monthly morbidity & mortality meeting.
- Fellow will take regular calls as per policy of the department

II. Evaluations

A log book which details the procedures the fellow has either done by him/herself or assisted in the **log book** should be evaluated by the supervising consultant on monthly basis. The log book presents **20%** of the evaluation process.

The fellow is evaluated at the end of every 4 months using evaluation form (provided). The evaluation process will be done by the supervising consultant on each rotation and presents **80%** of the evaluation process.

III. Certification

The candidate will be awarded King Saud University Fellowship in Bariatric Anesthesia

A complementary fellowship certificate will be provided from ISPCOP (International Society of Perioperative Care of Patient with Obesity)

IV. General Rules and Regulation

1. Registration

The candidates have to register as a fellow – postgraduate student in KSU as per the requirements of Postgraduate Medical Education.

2. Interruptions

Interruption of training should not be for more than 6 months with acceptable reasons and should be compensated for at end for training.

3. Withdrawal

Candidates can withdraw by providing a justified written request at least 3 months before the end of the training year.

4. Maximum period of training

Maximum period of training in the program should not exceed 24 months.

5. Disciplinary actions

Candidates that break the regulations of KSU fellowship programs would be questioned and the necessary action would be taken

6. Dismissal

a. Actions concerned with training like absence from duties or negligence should be dealt with by training committee.
b. Misbehavior or action affecting ethics should be dealt by a committee formed by the Postgraduate Medical Education Director. the committee can recommend one of the following:

I. A warning letters.

II. Warning and the fellow will be under probation for 3 months

III. Decision to dismiss the fellow.

Decision 1, 2 should be approved by the training committee and decision 3 should be approved by the Postgraduate Director.

7. Re-registration

Candidates dismissed or those that withdrew from the program cannot be re-registered.

8. Training committee

A training board should be formed from tutors in the participating hospitals with experience in Bariatric Anesthesia and postgraduate training education.

9. Vacation

The allowed vacation is **30 days per year**.