



## Recommendations to Manage Patients for Bariatric Surgery in the COVID-19 Pandemic: Experience from China

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To the Editor:

The novel coronavirus that arose in Wuhan in December 2019 is a new strain of coronavirus [1]. Most coronaviruses cause only mild respiratory illness such as the common cold, but the new virus, named SARS-CoV-2 by the WHO, can cause severe disease, pneumonia, severe acute respiratory syndrome (ARDS), kidney failure, and death [2–5]. Since there is no specific treatment, the goal now is to protect the susceptible population [1–4]. After the first cases were reported in early December in Wuhan [6, 7], the epidemic spread rapidly, but enforced lockdowns and other measures slowed the spread of the disease beyond Wuhan. By May, the number of new cases were as few as 25 per week. Except for Wuhan, most cities in China returned to work gradually, but throughout the rest of the world, the COVID-19 outbreak continued.

In our bariatric surgery department, we stopped elective bariatric surgeries in January to prepare for a possible influx of COVID-19 patients. Since our patients are obese and most have significant health comorbidities, it is important that they not be exposed to patients infected with SARS-CoV-2. Bariatric patients also have relatively weak immunity [8, 9]. As the epidemic came under control, we reopened in March and gradually started performing bariatric surgery again. Since bariatric surgery departments in other parts of the world will face the same challenges, we would like to narrate our experiences and give the recommendations of Chinese Society for Metabolic and Bariatric Surgery (CSMBS) on how to scientifically and safely conduct bariatric programs under these epidemic conditions.

Be aware that the initial inflow of patients for services once you reopen can be enormous because of pent-up demand that has grown in the interim. The demand will vary by region, depending on to what extent facilities were closed during the epidemic period. Our general rule for whether to open is based on the number of current confirmed cases at the time of the planned reopening. We only reopened in those provinces with less than < 100 confirmed cases and reopened cautiously in regions with 100 to < 500 cases. Patients should join a bariatric surgery program nearest to home to avoid the risks of infection associated with travel. Surgery should not be performed in a hospital that has treated COVID-19 patients until the hospital has been disinfected according to recommendations [1].

For the prehospital evaluation, we recommend (1) that consultation be conducted virtually by means of WeChat, email, or telephone, to investigate whether patients may have COVID-19 by asking about symptoms or any history of recent travel to epidemic areas. If the consultation suggests the presence of COVID-19 infection, the patient should be advised to report to a nearby COVID-19 test center. (2) If no concerns, then record demographics and clinical information and advise

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the patient online about diet and physical exercise protocols. (3) If the BMI is more than 50 kg/m<sup>2</sup>, the patient should adopt dietary adjustment and reasonable exercise to reduce 5% of the excess weight before admission [10, 11]. Make an appointment for CT scan, routine blood test, and nucleic acid test before admission. (4) After admission, the patient and medical staff should take protective measures (use of personal protective equipment [PPE]). The patient must test negative for COVID-19 by PCR. The admission flow chart should be followed (Fig. 1).

For the preoperative evaluation, we recommend (1) re-evaluation of epidemiological information to exclude COVID-19-infected if necessary; (2) re-evaluate whether there is any history of fever or respiratory symptoms; confirm the results of lung CT, nucleic acid test, routine blood examinations, and other relevant tests. Repeat the PCR if necessary in case of a false positive; (3) complete a preoperative

examination of cardiopulmonary function; use continuous positive airway pressure (CPAP) to improve lung ventilation and systemic hypoxia in cases of obesity hypoventilation syndrome (OHS); for cardiopulmonary insufficiency or severe complications, there should be an online consultation of the departments of anesthesia, respiratory, cardiovascular, endocrine, and other relevant departments to plan the surgical timing and provide individualized diagnosis and treatment [12]. The process for emergency patients should be followed in those cases. If SARS-CoV-2 infection is confirmed or highly suspected, preoperative preparation should be completed in an isolation ward (Fig. 2).

For operating room management, we recommend (1) maintaining a high vigilance to prevent nosocomial infection until more is known about the disease. Be aware that some patients could be in a long incubation period following infection with SARS-CoV-2 and have no clinical manifestations but could

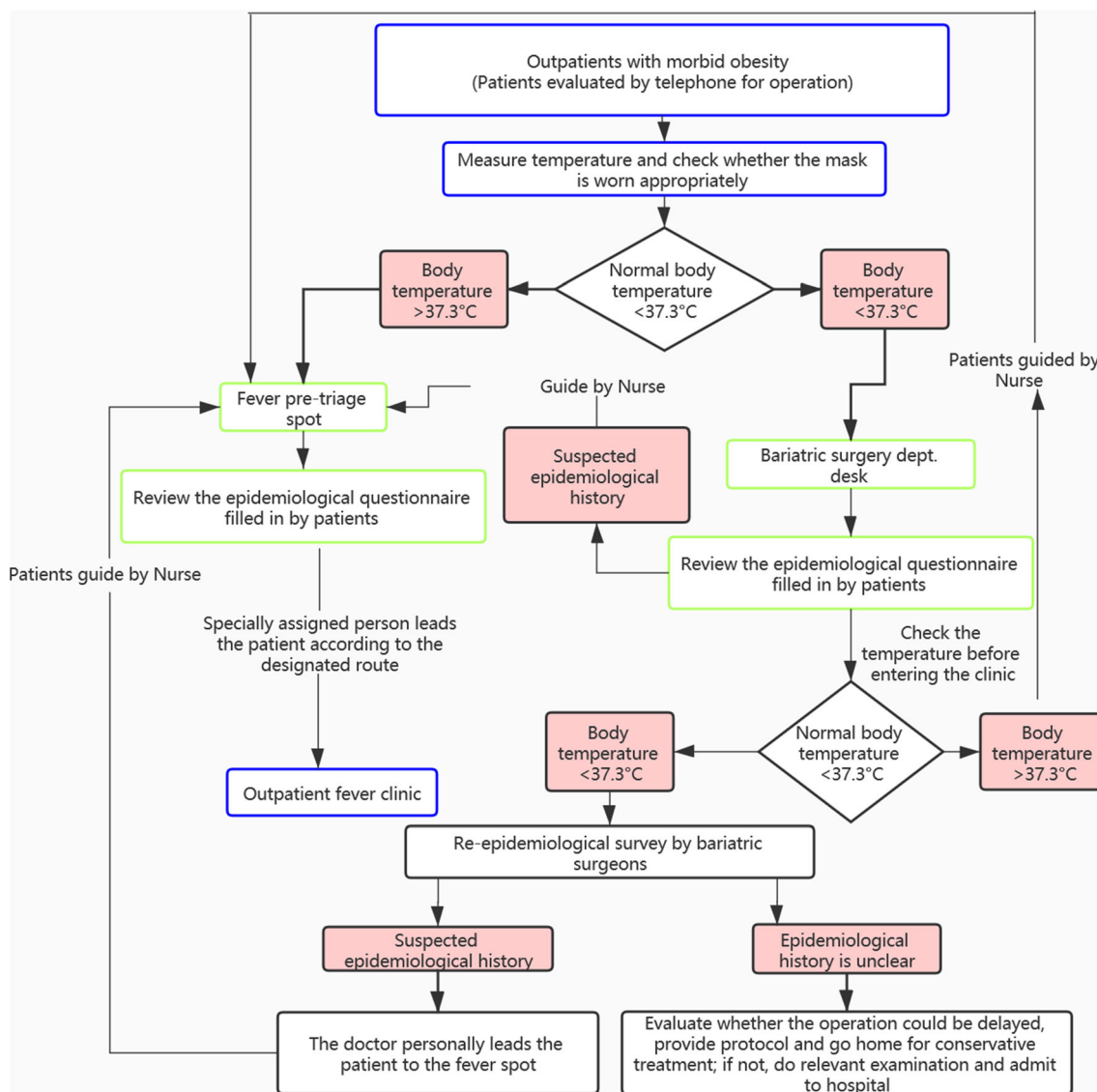


Fig. 1 Clinic process of morbid obesity patients

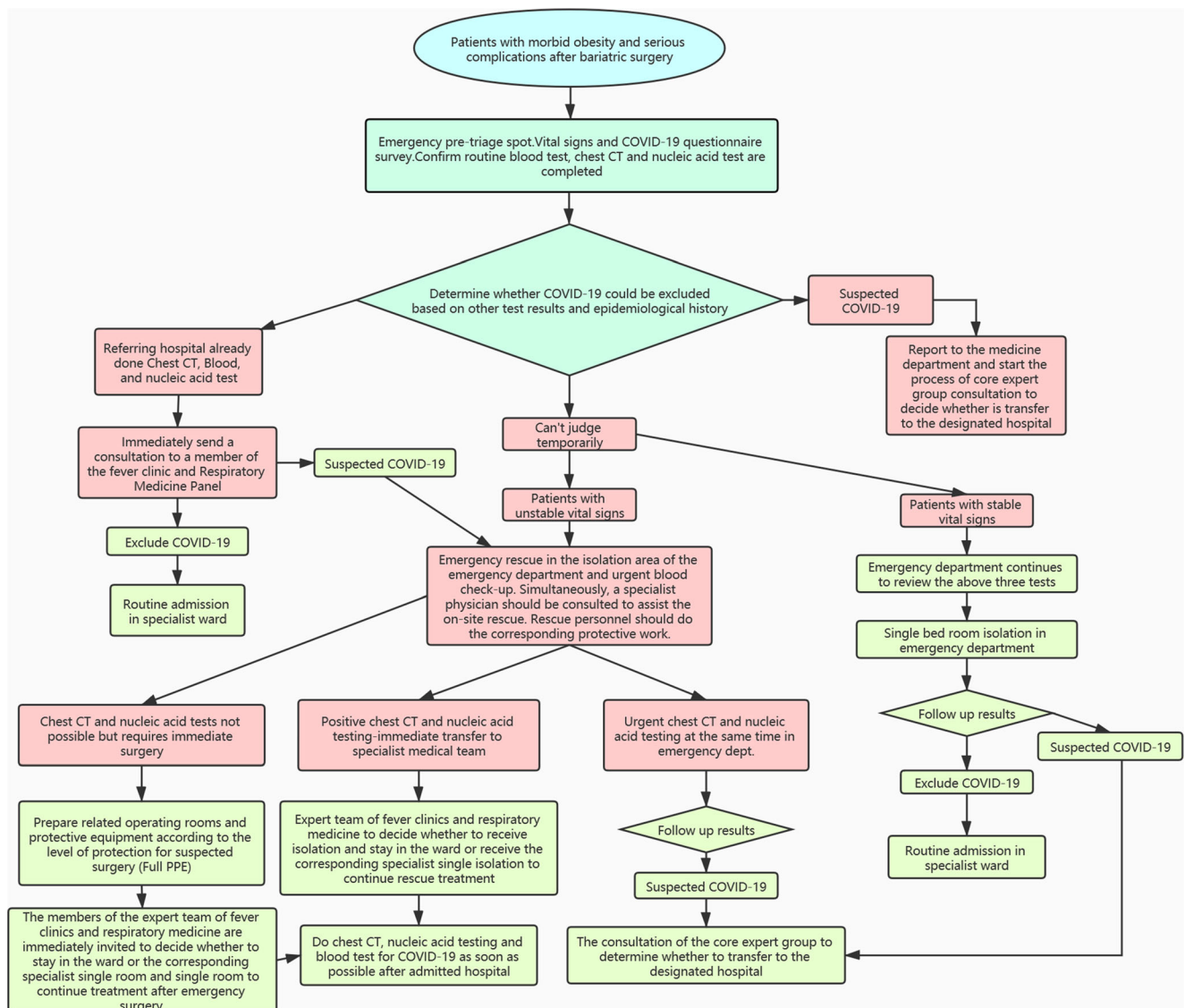


Fig. 2 Admission process of emergency patients

be infective. (2) Routine blood exam, PCR, CT, and epidemiological screening should be redone when the patient is about to enter the operating room. (3) Proper donning and doffing of full PPE is necessary; patients should wear a surgical mask. Since endotracheal tube insertion is an aerosol generating procedure (AGP), the anesthesiologist should wear appropriate PPE and use a disposable breathing tube. (4) Rapid recovery anesthesia should be used for a quick and enhanced recovery. (5) If the patient needs to be admitted to ICU/HDU postoperatively, they should be in a designated non-COVID-19 area to prevent cross-infection. (6) When patients return to the ward after surgery, use a single room to avoid potential cross-infection and limit the number of visitors. (7) Patient mobility should be restricted within the patient’s room or in an area with good air circulation, and the patient be required to wear a mask throughout the hospital [13]. If SARS-CoV-2 infection is confirmed or highly suspected, the patient should be placed

in a negative pressure/infection room for surgery, and the number of theater team members should be minimized. After the operation, the operation room should be thoroughly disinfected [1, 2].

For prevention of nosocomial infection, we recommend that (1) unnecessary visitors not be allowed in the hospital. (2) Medical staff should practice secondary protection during routine diagnosis and treatment and during AGP procedures. (3) A preoperative health handbook should be provided, and personnel instructed to wear masks, perform hand hygiene, and reduce unnecessary close contact. (4) Patients with any sign of fever and cough during hospitalization should undergo a COVID-19 test. (5) Testing before discharge is unnecessary for all patients. We advise limited social activities after discharge [14].

For follow-up after discharge, we recommend follow up by telephone, WeChat, email, QQ, Facebook, or online medical

platform. (1) Immunocompromised or patients with weak immunity after surgery need to be isolated and rest at home after discharge to avoid infection. (2) If patients encounter complications, treatment at a local hospital is recommended.

For nutritional support, we recommend that inpatients receive a nutritional risk evaluation from a dietician so that they have a high-protein diet with carbohydrates and vitamins appropriate to the blood profile of the patient [13]. The diet should be based on the type of surgical procedure. Patients should exercise and perform strength training [14].

For mental health problems, we recommend that (1) patients be aware of and avoid rumors and fake news. (2) Reduce somatization symptoms and improve the immune response by mental self-regulation. Good mental health can be maintained by (3) a healthy diet, regular exercise, and adequate sleep and (4) keeping in contact with relatives, friends, or colleagues by online means to control emotions, express feelings, and (5) maintain communication with society. (6) Take the crisis as an opportunity for growth. (7) If symptoms cannot be alleviated, ask for help from the surgeon and professional bariatric surgery team [15].

### Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethical Approval Statement** This article does not contain any studies with human participants or animals performed by any of the authors.

**Informed Consent Statement** Informed consent does not apply.

### References

1. Liang T. Handbook of COVID-19 prevention and treatment. The First Affiliated Hospital, Zhejiang University School of Medicine. Compiled According to Clinical Experience, 2020.
2. World Health Organization. Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected: interim guidance, 25 January 2020. World Health Organization, 2020.
3. Wang D, Hu B, Hu C, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China. *JAMA*. 2020;323(11):1061–9.
4. Spinelli A, Pellino G. COVID-19 pandemic: perspectives on an unfolding crisis. *Br J Surg*. 2020;10
5. Lai CC, Shih TP, Ko WC, et al. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and corona virus disease-2019 (COVID-19): the epidemic and the challenges. *Int J Antimicrob Agents*. 2020;105924
6. COVID-19 situation in China. <http://www.nhc.gov.cn/>.
7. World Health Organization. Novel coronavirus (COVID-19) situation dashboard. 2020.
8. Francisco V, Pino J, Campos-Cabaleiro V, et al. Obesity, fat mass and immune system: role for leptin. *Front Physiol*. 2018;9:640.
9. Honce RR, Schultz-Cherry S. Impact of obesity on influenza A virus pathogenesis, immune response, and evolution. *Front Immunol*. 2019;10:1071.
10. Zheng MH, Boni L, Fingerhut A. Minimally invasive surgery and the novel coronavirus outbreak: lessons learned in China and Italy. *Ann Surg*. 2020; Publish Ahead of Print
11. Busetto L, Dicker D, Azran C, et al. Practical recommendations of the obesity management task force of the European Association for the Study of obesity for the post-bariatric surgery medical management. *Obes Facts*. 2017;10(6):597–632.
12. Pratt JSA, Browne A, Browne NT, et al. ASMBS pediatric metabolic and bariatric surgery guidelines, 2018. *Surg Obes Relat Dis*. 2018;14(7):882–901.
13. Sherf Dagan S, Goldenshluger A, Globus I, et al. Nutritional recommendations for adult bariatric surgery patients: clinical practice. *Adv Nutr*. 2017;8(2):382–94.
14. Jin YH, Cai L, Cheng ZS, et al. A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). *Mil Med Res*. 2020;7(1):4.
15. Lai J, Ma S, Wang Y, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open*. 2020;3(3):e203976–6.

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