Obesity and COVID-19

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OUTLINE

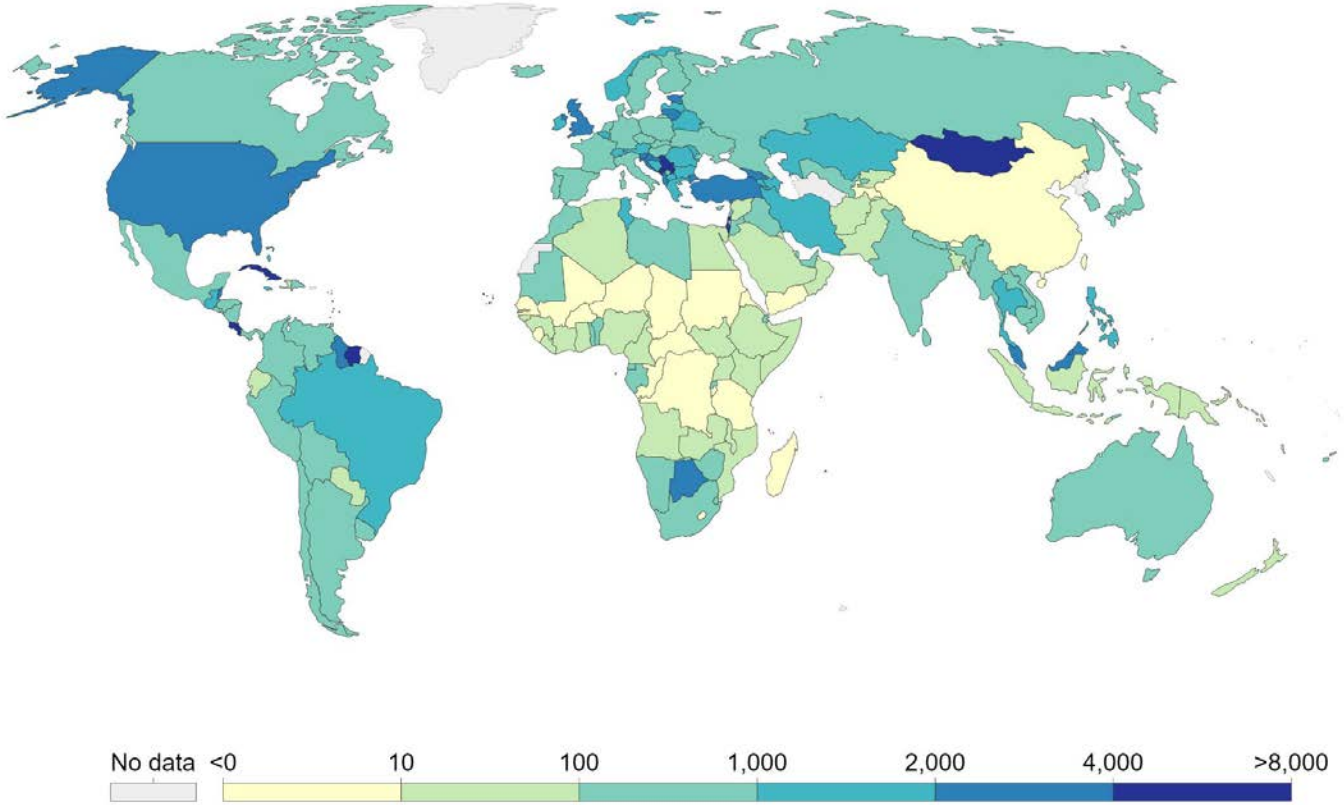
- Collision of Pandemics
- Pathophysiology of COVID-19 Infection
- COVID-19 and Obesity
- Management of Obesity

Collision of Pandemics

Weekly confirmed COVID-19 cases per million people

Weekly confirmed cases refers to the cumulative number of cases over the previous week.

Our World in Data

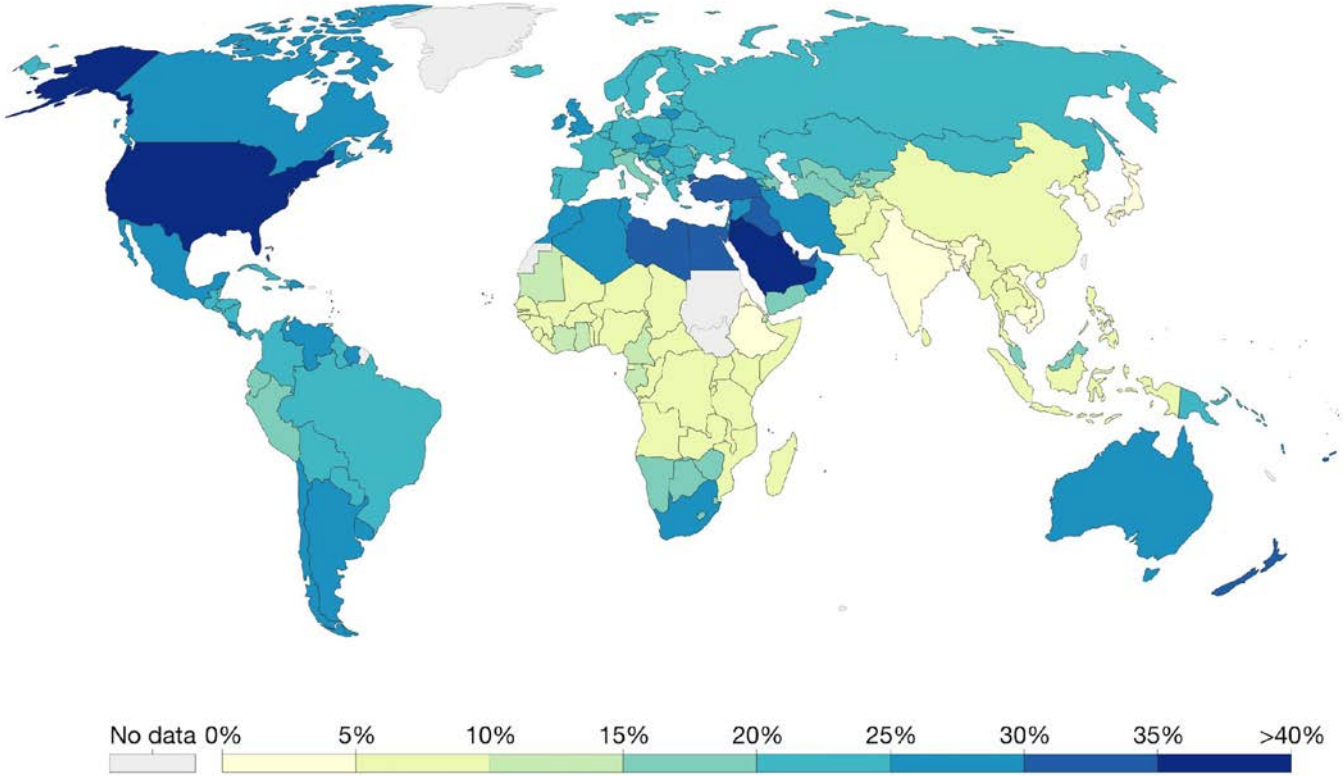


Source: Johns Hopkins University CSSE COVID-19 Data – Last updated 21 September, 10:04 (London time)

Share of adults defined as obese, 2016

Percentage of adults aged 18+ years old who are defined as obese based on their body-mass index (BMI). BMI is a person's weight in kilograms (kg) divided by his or her height in metres squared. A BMI greater than or equal to 30 is defined as obese.

Our World in Data



Source: WHO, Global Health Observatory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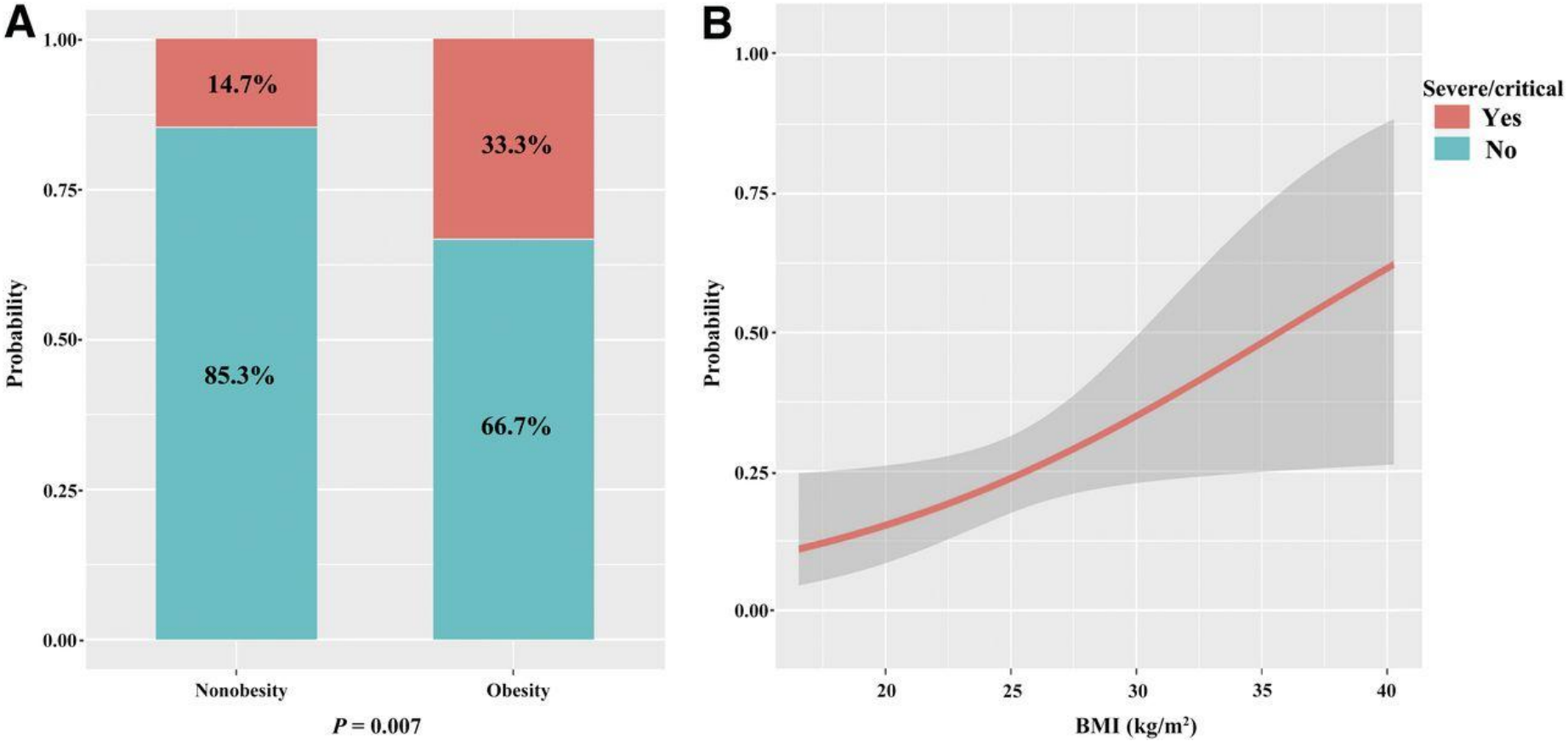
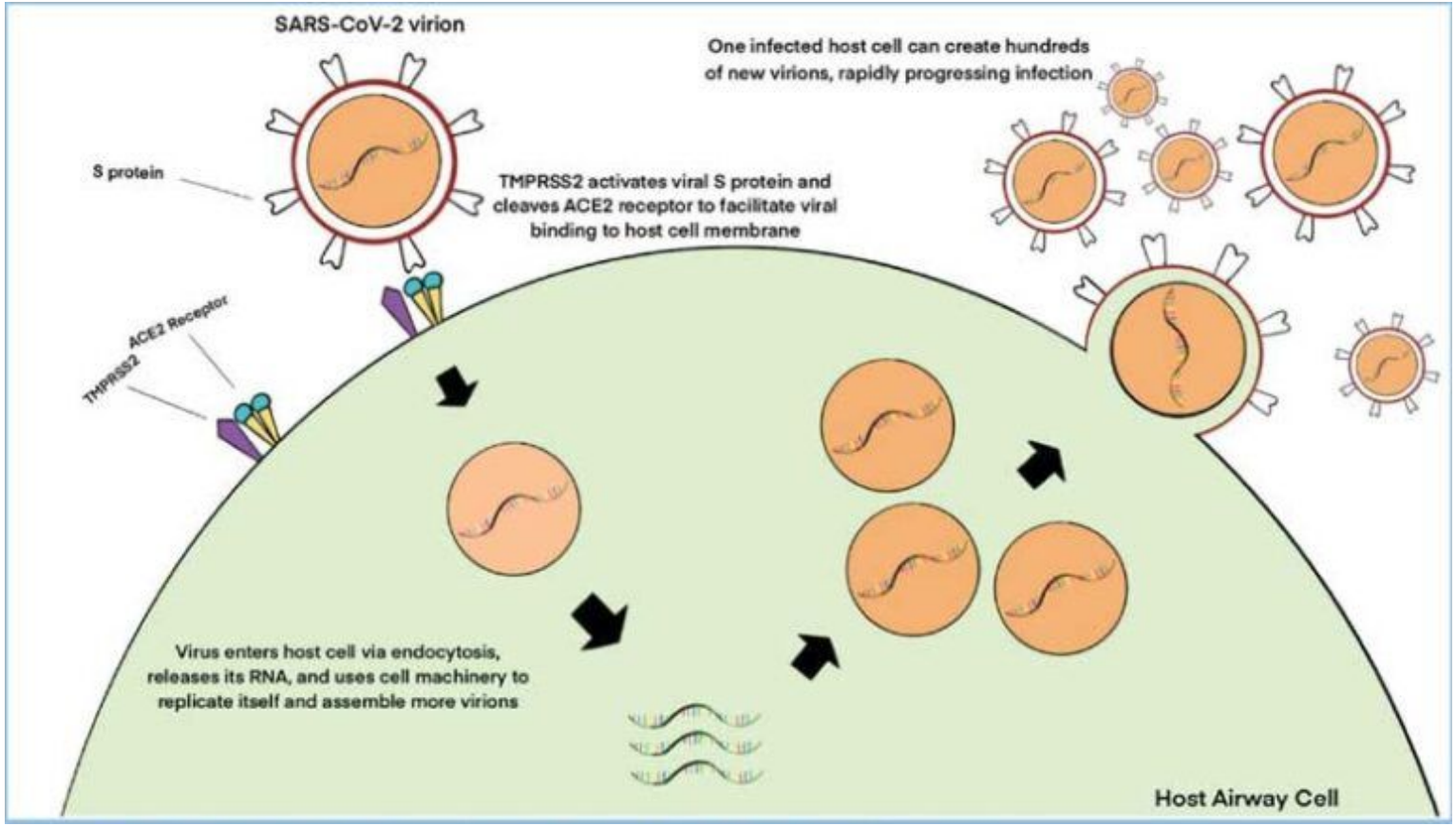


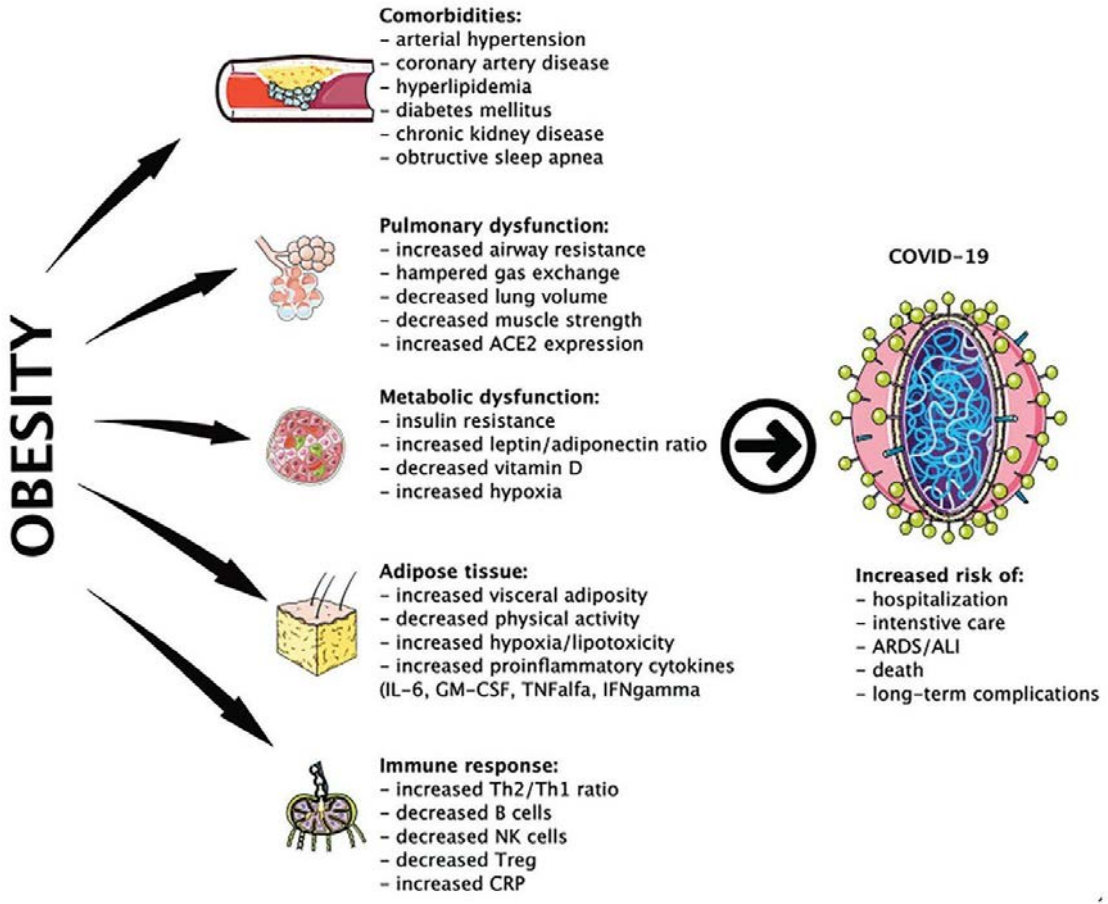
F Gao, et al. *Obesity is a Risk Factor for Greater COVID-19 Severity*. Diabetes Care 2020 Jul; 43(7): e72-e74.

Pathophysiology of COVID-19 Infection



Wiersinga WJ, Rhodes A, Cheng AC, et al. Pathophysiology, transmission, diagnosis, and treatment of Coronavirus Disease 2019 (COVID-19): a review. *JAMA*. 2020;324(8):782-793.

COVID-19 and Obesity


OBESITY
Comorbidities:
- arterial hypertension
- coronary artery disease
- hyperlipidemia
- diabetes mellitus
- chronic kidney disease
- obtructive sleep apnea
Pulmonary dysfunction:
- increased airway resistance
- hampered gas exchange
- decreased lung volume
- decreased muscle strength
- increased ACE2 expression
Metabolic dysfunction:
- insulin resistance
- increased leptin/adiponectin ratio
- decreased vitamin D
- increased hypoxia
Adipose tissue:
- increased visceral adiposity
- decreased physical activity
- increased hypoxia/lipotoxicity
- increased proinflammatory cytokines
(IL-6, GM-CSF, TNFalfa, IFNgamma
Immune response:
- increased Th2/Th1 ratio
- decreased B cells
- decreased NK cells
- decreased Treg
- increased CRP
COVID-19
Increased risk of:
- hospitalization
- intenstive care
- ARDS/ALI
- death
- long-term complications

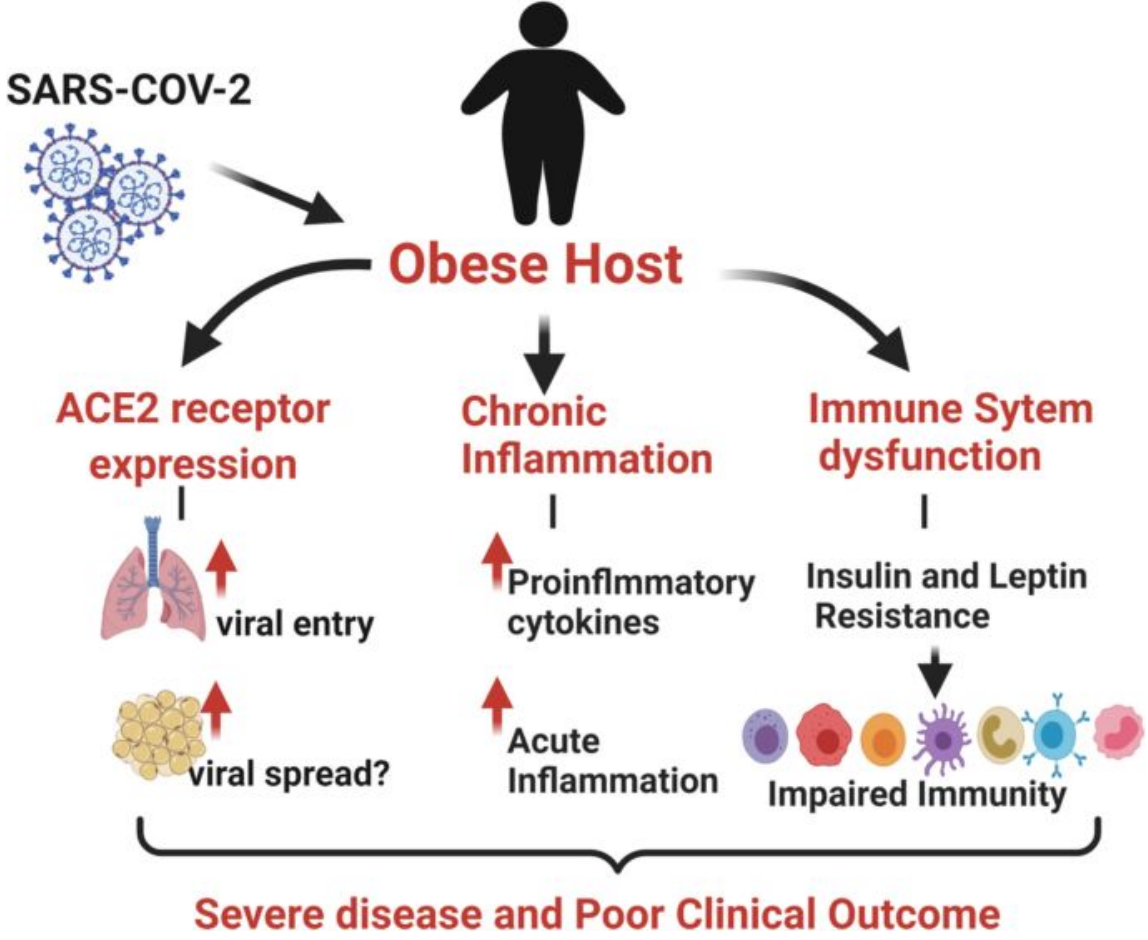

SARS-COV-2
Obese Host
ACE2 receptor expression
Chronic Inflammation
Immune Sytem dysfunction
viral entry
viral spread?
Proinflmmatory cytokines
Acute Inflammation
Insulin and Leptin Resistance
Impaired Immunity
Severe disease and Poor Clinical Outcome

TABLE 1. Obesity as a risk factor for the worse COVID-19 course

STUDY	PATIENTS	HOSPITALIZATION OR (95% CI)	ICU ADMISSION OR (95% CI)	IN-HOSPITAL DEATH OR (95% CI)	SEVERE COURSE OR (95% CI)
Popkin[7]	399,461	2.13 (1.74–2.60)	1.74 (1.46–2.08)	1.48 (1.22–1.80)	–
Cai[8]	383	–	–	–	3.40 (1.40–2.86)
Simonnet[9]	124	–	7.36 (1.63–33.14)[a]	–	–
Petrilli[10,b]	5,279	–	–	1.45 (0.99–2.13)	1.71 (1.10–2.70)
Yates[11]	54,254	–	3.91 (3.13–4.88) 5.03 (3.94–6.63)[a]	1.93 (1.49–2.51)	–
Kompaniyets[12,b]	148,494	1.33 (1.30–1.37)	1.16 (1.11–1.20) 2.08 (1.89–2.29)[a]	1.61 (1.47–1.76)	–

OR: odds ratio; CI: confidence interval; ICU: intensive care unit
[a]Requiring invasive mechanical ventilation [b]BMI > 40 kg/m^2

Challenges in Treatment

Social Stigma

Clinical Challenges

Vaccination Response

Management of Obesity

Treating Obesity

Discuss the Stress

Encourage Physical Activity

Create a Team Approach

Bariatric Surgery

Gastric bypass, Gastric band,
Sleeve gastrectomy, BPD/DS

Pharmacotherapy

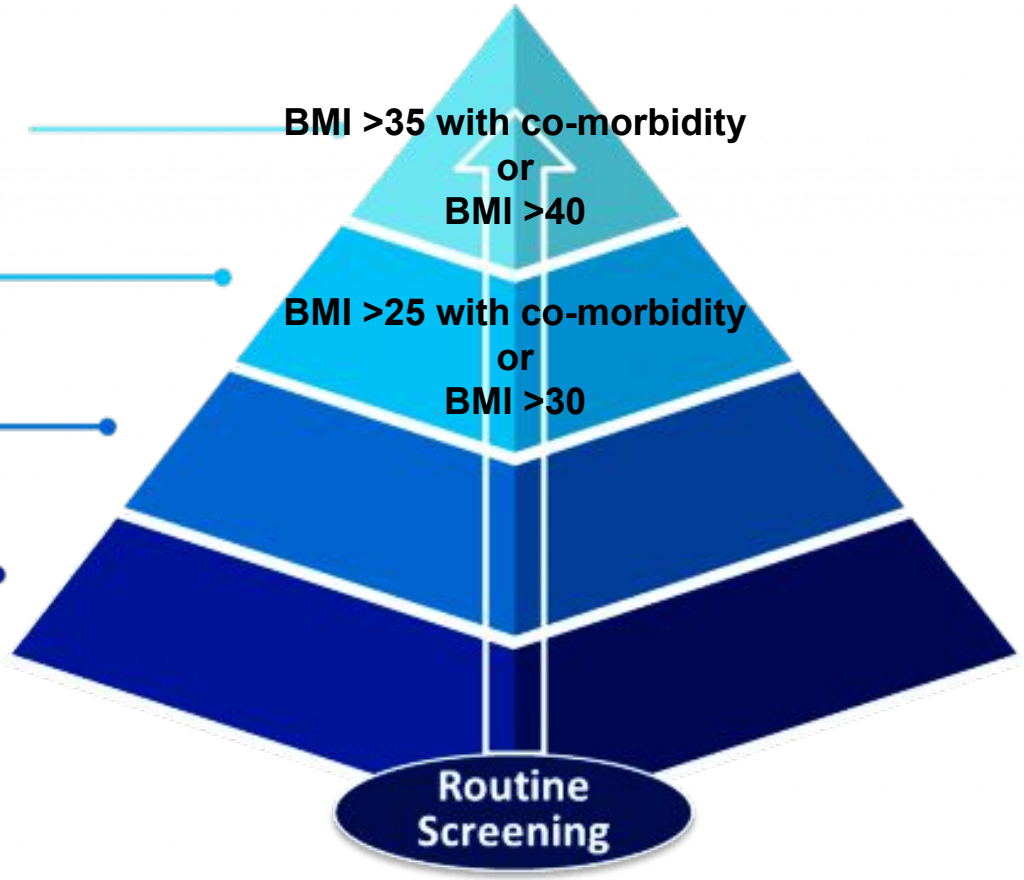
Orlistat, Lorcaserin, Phentermine-topiramate,
Naltrexone-bupropion, Liraglutide

IBT / Nutrition Counseling

Intensive behavioral therapy for obesity, MNT,
Dietitian counseling

Weight Management Program

Clinic, community, worksite, digital



Diet and Weight Loss

Keto Diet	4 lbs weight loss at 1 year • 53% 1 year completion rate
Zone Diet	7 lbs weight loss at 1 year • 65% 1 year completion rate
Weight Watchers	6 lbs weight loss at 1 year • 65% 1 year completion rate

Medications for Weight Loss

Xenical (Orlistat)	13.4 lbs at 1 year • GI symptoms, risk of liver damage
Adipex (Phentermine)	6-8 lbs at 1 year • High blood pressure, palpitations
Qsymia (Phentermine/Topiramate)	14.5-19 lbs at 1 year • Tachycardia, palpitations
Contrave (Naltrexone/Bupropion)	6-8 lbs at 1 year • GI symptoms, headache
Glucagon-like Peptide 1 (GLP1) Agonists	15-20 lbs at 1 year • Hypoglycemia, delayed gastric emptying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STOP

Physical Discrimination

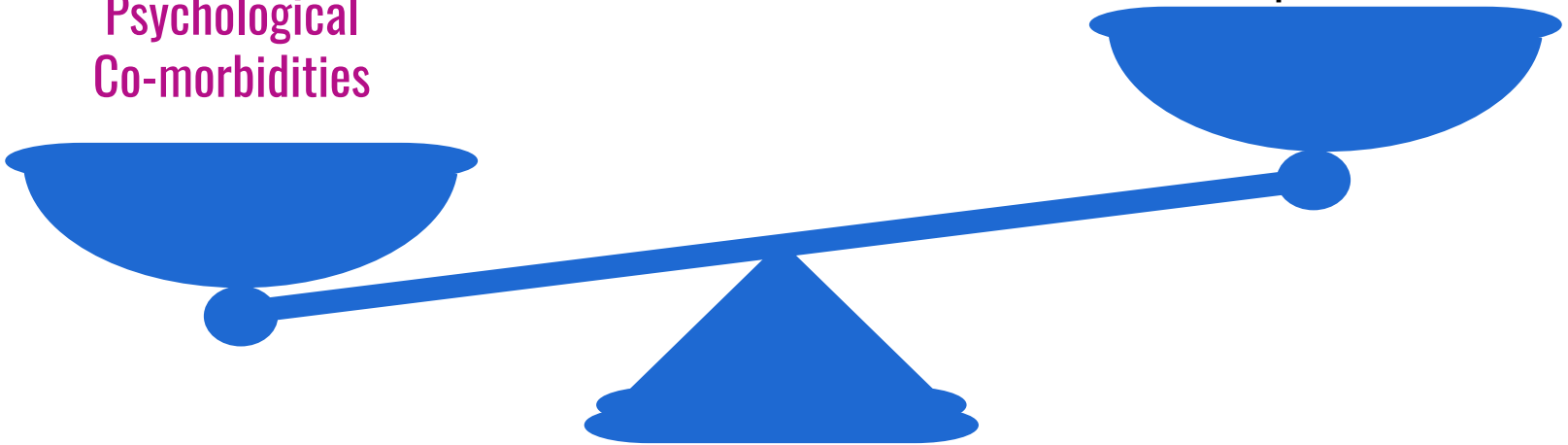
Social Discrimination

Psychological Co-morbidities

Bariatric Surgery

<2%

risk of serious complications




Exercise
Nutrition
Surgery
Support System

Who Needs Surgery?

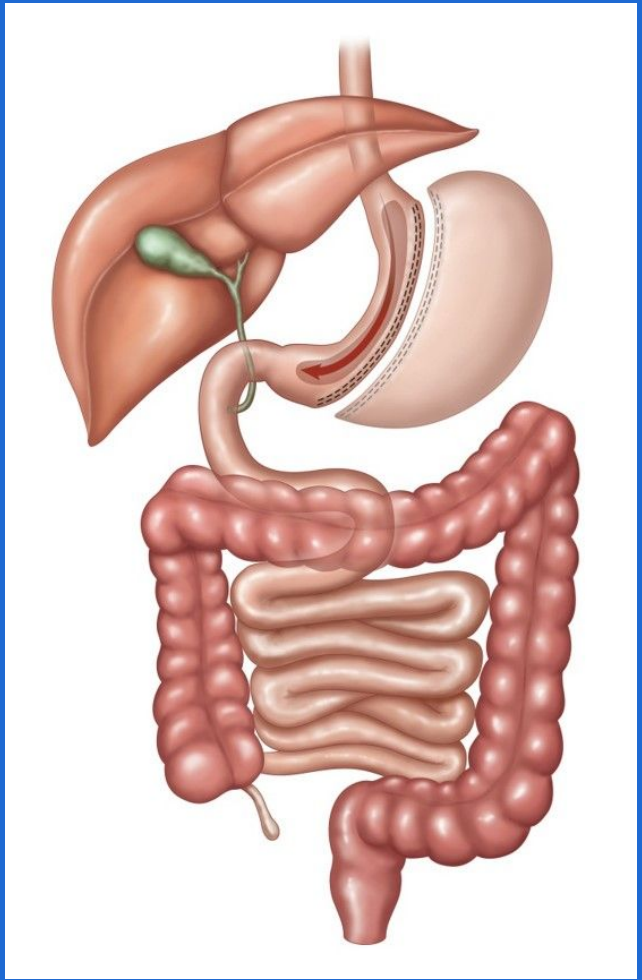
- BMI greater than 40 or greater than 35 with co-morbid condition present for at least 3 years
  - *Hypertension*
  - *Heart Disease*
  - *Diabetes*
  - *Pulmonary Hypertension*
  - *Severe Obstructive Sleep Apnea*
- At least 18 years old
- Insurance often requires participation in 6-month medically supervised weight loss program within the past year

Types of Surgeries

- **Restrictive Surgeries**
  - *Sleeve gastrectomy*
  - *Adjustable gastric banding*
- **Malabsorptive Surgeries**
  - *Duodenal switch*
- **Hybrid of Restrictive and Malabsorptive Surgeries**
  - *Roux-en-Y gastric bypass*

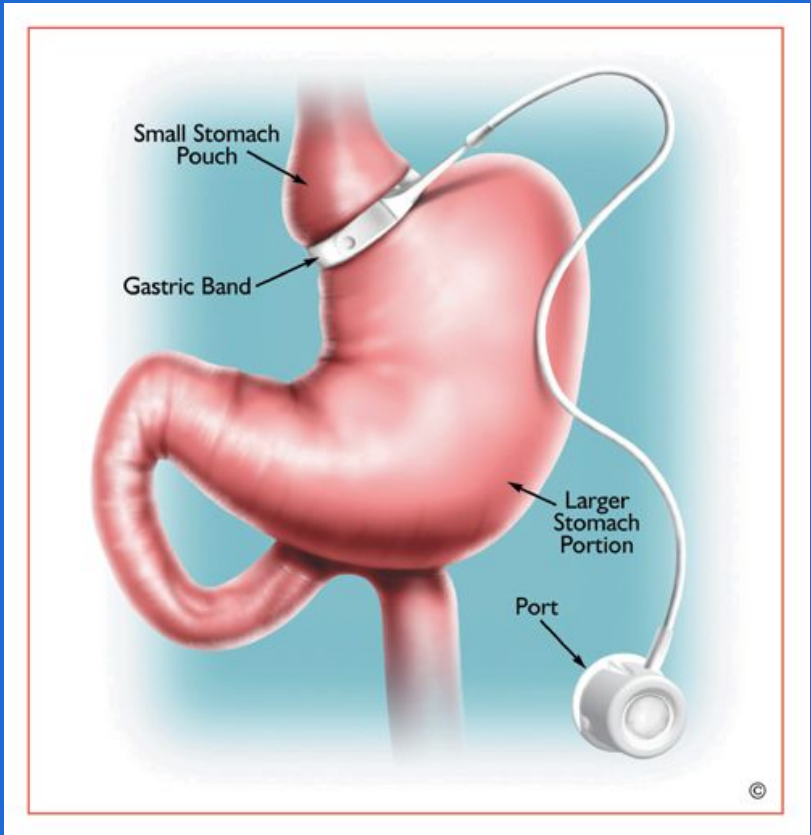
Sleeve Gastrectomy

- 60-65% EBW Loss
- Irreversible
- No changes in normal intestinal transit
- Risks:
  - *Leak*
  - *Bleed*
  - *Infection*
  - *GERD*



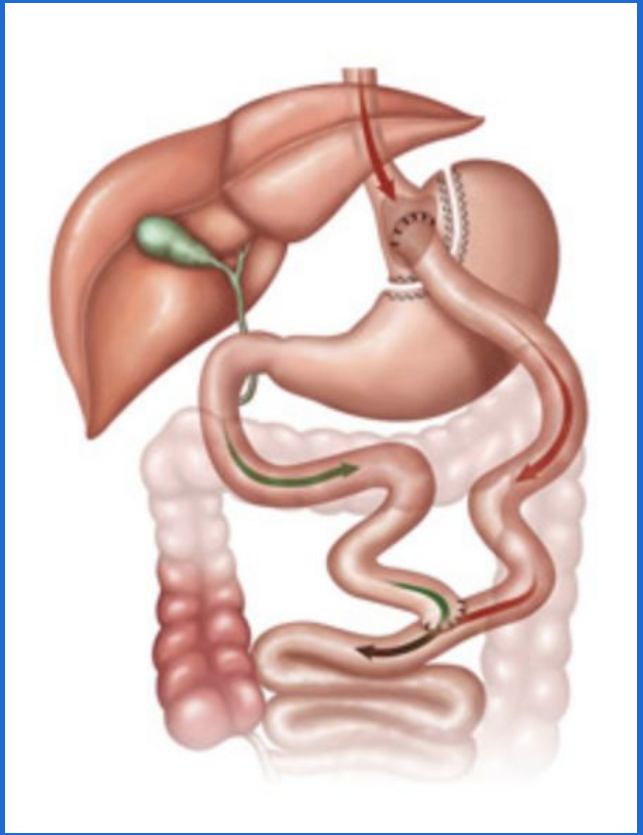
Adjustable Gastric Banding

- 30-35% EBW Loss
- Reversible
- Adjustable in office
- No changes in normal intestinal transit
- Risks:
  - *Erosion*
  - *Slippage*
  - *Dysphagia*



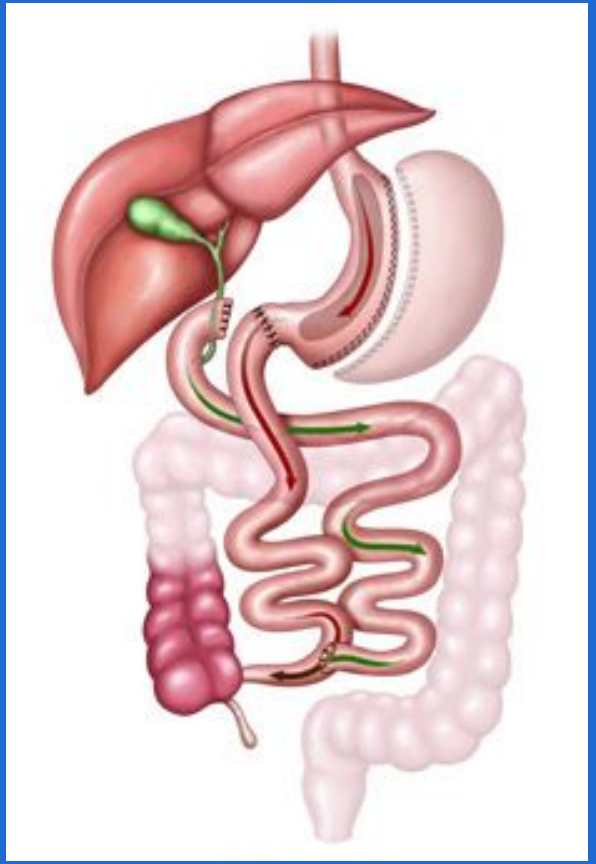
Roux-en-Y Gastric Bypass

- 65-70% EBW Loss
- Reversible
- Changes normal intestinal transit
- Risks:
  - *Leak*
  - *Bleed*
  - *Infection*
  - *Hernia*
  - *Ulcer*
  - *Stricture*



Duodenal Switch

- 70-75% EBW Loss
- Partially reversible
- Changes normal intestinal transit
- Risks:
  - *Leak*
  - *Bleed*
  - *Infection*
  - *Hernia*
  - *Stricture*
  - *Malabsorption*

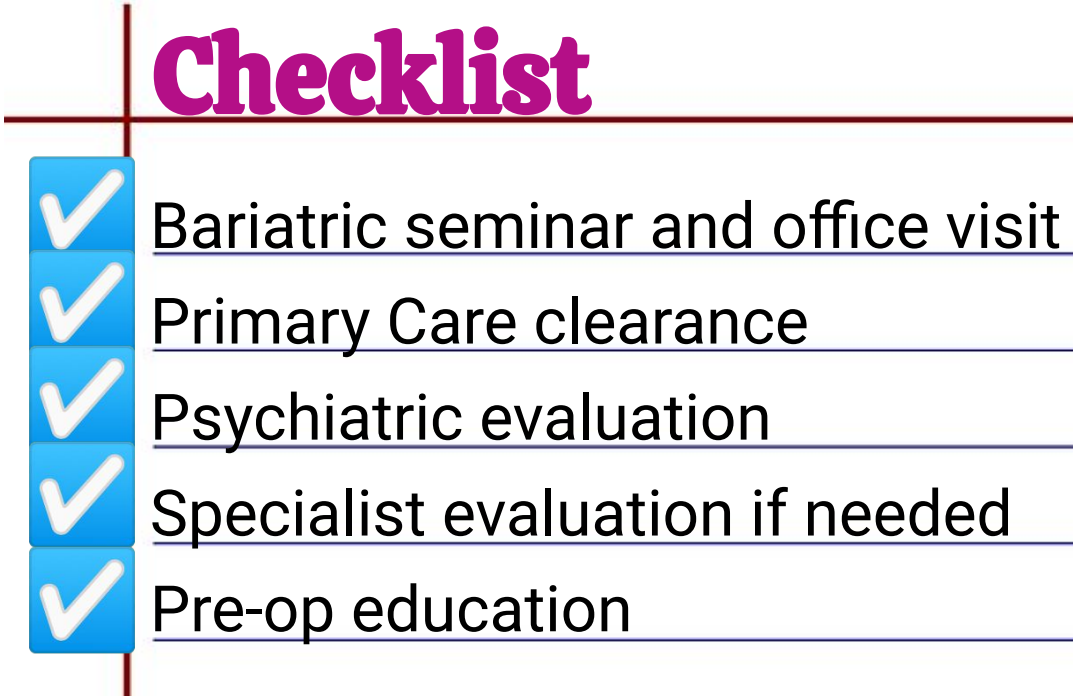


What to Expect While in the Hospital

- Operative Time
  - *Sleeve: 30-60 minutes*
  - *Bypass: 60-90 minutes*
  - *Duodenal Switch: 75-100 minutes*
- Hospital Stay
  - *Usually 1 day*
  - *Must be able to walk, drink enough fluids to stay hydrated and have pain controlled before going home*
- Liquid diet after surgery while in hospital

Life After Surgery

- Follow progressive bariatric diet and healthy eating plan for life
- Vitamin supplements
- Physical activity
- Keep up with follow-up appointments


Checklist
Bariatric seminar and office visit
Primary Care clearance
Psychiatric evaluation
Specialist evaluation if needed
Pre-op education

Management of Obesity

To-do List

- **STOP SMOKING**
- Start an exercise program
- Start diet plan

Summary

- COVID-19 and Obesity are both pandemics, each affecting the other
- The pathophysiology of COVID-19 results in worse outcomes for patients with obesity
- Patients with obesity face unique challenges in medical care of COVID-19
- There are many methods to manage and treat obesity including behavioral modification, diet and exercise education, medications and surgery

Start by doing what is necessary, then what is possible, and suddenly you are doing the impossible.

St. Francis of Assisi


ITS KIND OF FUN TO
DO THE IMPOSSIBLE.
-WALT DISNEY

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