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## COVID-19 Clinical Corner

### Obesity as a Risk Factor

#### Key Messages: Obesity

- *Being overweight or obese may be a risk factor for having a complicated experience with COVID-19.*
- *Obesity is a common chronic disease seen in younger adults hospitalized for COVID-19.*
- *Recognize that being overweight and obese is a risk factor for morbidity and mortality. Prevention and management strategies are key to improving patient health outcomes and quality of life.*
- *Encourage regular and accurate weight documentation for patients in the OHIS EMR (Offender Health Information System - Electronic Medical Record). This will help with calculations for energy / nutrient requirements, body mass index (BMI) and optimal dosing of medications.*

Obesity, a chronic disease, is linked to a number of cardiac, respiratory and metabolic comorbidities, such as diabetes and hypertension which are major risk factors for cardiovascular disease (CVD)(1). A 2018 retrospective Canadian study examined how incarceration influenced inmates' (n=1420) weight in correctional institutions; weight gain was found to be associated with older age, region, ethnicity, longer incarceration, and longer total sentence (2). In 2016, a needs assessment from Rhode Island found that the prevalence of obesity in incarcerated men in the study sample was similar to the prevalence among men in Rhode Island in the community (25% vs 23%) at the time of incarceration; the prevalence of obesity increased to 35% in those who were incarcerated, in an average of 6.4 months (3).

Risk factors associated with severe COVID-19 illness includes advanced age, immunosuppression, organ failure and underlying medical comorbidities such as diabetes and CVD (4,5). Preliminary U.S. data (6) suggest that those with underlying health conditions such as diabetes, chronic lung disease and CVD, appear to be at higher risk for severe COVID-19-associated disease relative to individuals without these

conditions. A recent retrospective analysis from New York University Langone Health suggests obesity as an independent risk factor for COVID-19 hospital admission, for patients younger than 60 years (7). About 21% (n=775) of the 3615 individuals who tested positive had a body mass index (BMI) of 30-34 kg/m<sup>2</sup> and 16% (n=595) had a BMI of ≥35 kg/m<sup>2</sup>. The authors found the following (7):

- Patients <60 years with a BMI between 30-34 kg/m<sup>2</sup> were 2.0 (95% 1.6-2.6, p<0.0001) and 1.8 (95% CI 1.2-2.7, p=0.006) times more likely to be admitted to acute care and critical care, respectively (7).
- Patients with a BMI 35 kg/m<sup>2</sup> and over and who were younger than 60 years were 2.2 (95% CI 1.7-2.9, p<0.0001) and 3.6 (95% CI 2.5-5.3, p<0.0001) times more likely to be admitted to acute and critical care compared to patients in the same age category who had BMI < 30 kg/m<sup>2</sup> (7).

The U.S. Centers for Disease Control and Prevention (CDC) lists severe obesity as a risk factor (8) for serious COVID-19 illness, defined as a BMI of ≥40 kg/m<sup>2</sup>. Severe obesity, it states, can increase the risk of acute respiratory distress syndrome, a major complication of COVID-19 which can cause "difficulty with a doctor's ability to provide respiratory support for seriously ill patients" (8). In addition, those living with obesity can have underlying conditions which can increase the risk of severe illness from COVID-19 (8).

A recent CDC report looked at hospitalization rates and characteristics of patients hospitalized with laboratory-confirmed COVID-19 in 14 states from March 1-30, 2020 (9). Out of the approximately 180 patients hospitalized adults reported through COVID-NET, 89.3% had one or more underlying conditions. In patients:

- 18-49 years, obesity was the most prevalent underlying condition, followed by chronic lung disease (mostly asthma) and diabetes mellitus.
- 50-64 years, obesity was most prevalent, followed by hypertension and diabetes.
- 65 years and older, hypertension was most prevalent, followed by CVD and diabetes



The European Association of the Study of Obesity Position Statement on the Global COVID-19 Pandemic (10), reports that the “COVID-19 pandemic is likely to have a significant impact on people with obesity.” The authors cite a retrospective cohort study in France that found that patients with severe obesity, defined as BMI > 40 kg/m<sup>2</sup>, who contracted COVID-19 were more likely to need invasive mechanical ventilation, independent of age, hypertension and diabetes (11). A letter to the Editor describing clinical characteristics of COVID-19 in New York City, stated that among the 393 patients admitted between March 3 and March 27, 2020, 35.8% of them had obesity (12). In addition, obesity was observed as a factor in patients who received invasive mechanical ventilation compared to those who did not receive this intervention.

### What can we do for our patients?

CSC clinicians should recognize their patients’ risk factors for morbidity and mortality to help identify prevention and management strategies with the goals of improving patient health, quality of life, body weight and composition. Under ordinary circumstances, resources such as on-site dietician services and gyms are available to help with lifestyle choices. In the current pandemic situation, remote dietitian services may be needed to assist with diet and homegrown solutions for engagement in exercise.

Identify patients who are overweight and obese, and who also have diabetes with poor glycemic control. Good glycemic control can help reduce infection risk and severity, and patients would benefit from reassessment of for example, their target Hb A1c and a review of their medications. Patients may also benefit from undergoing a global CVD risk reduction and health education surrounding their CVD risk along with discussion on which risks are modifiable and how to control them. It is also important for clinicians to document the patient’s weight accurately in their individual charts as this informs calculations for energy/nutrient requirements, body mass index (BMI) and optimal dosing of medications

Health Services staff are encouraged to educate patients regarding the importance of exercise. Given current offender movement restrictions in place, it is vital to think more broadly toward exercises that can be easily completed in a person’s living environment. Patients should also understand the importance of participating in recreation time when possible with activities that can be done while respecting COVID-19 precautions such as physical distancing.

Obesity and depression have a bidirectional relationship, where obesity is a risk factor for mood disorders and vice versa. High levels of stress and depressive symptoms may also contribute to weight gain, especially being amidst the COVID-19 pandemic. A tailored approach may be needed for each patient in assessing anxiety, depression, self-harm and other mental

health issues, along with coping strategies. Staff collaboration is key in determining tailored health interventions especially for people who are overweight and obese.

Continue to emphasize personal protection measures to prevent transmitting, spreading, or acquiring COVID-19, specifically (13, 14):

- Regular hand hygiene, using alcohol based hand rub or soap and water (dry hands with a single-use towel)
- Observe and maintain physical distancing
- Optimize respiratory hygiene. Cover mouth and nose with tissue when coughing or sneezing or cough into the bend of your arm, discard tissue immediately in a covered bin, and perform hand hygiene
- Avoid touching eyes, nose or mouth as the virus can survive on surfaces.

Continue to emphasize importance of vaccinations including pneumococcal vaccine given the increased risk of secondary bacterial infection with COVID-19 patients.

Stay tuned as more data becomes available.

Please send any other clinical questions related to COVID-19 to [GEN-NHQ Pharmacy](#).

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### Appendix A: WHO classification of obesity (15):

BMI (kg/m <sup>2</sup> )	Classification
<18.5	Underweight
≥18.5 and <25.0	Normal weight
≥25.0 and <30.0	Overweight
≥30.0 and <35.0	Obese Class I
≥35.0 and <40.0	Obese Class II
≥40.0	Obese Class III

### Appendix B: Other Definitions of Obesity in Adults (16)

Criteria	Male	Female
Waist circumference (inches) <sup>a</sup>	≥40 (102 cm)	≥35 (88 cm)
Waist-to-hip ratio	≥0.95	≥0.85
Percent body fat (%)	≥25	≥32

<sup>a</sup> Asian men: ≥90 cm; Asian women: ≥80cm