



A Public Entity

Inland Empire Health Plan



To: Skilled Nursing Facilities
From: IEHP – Provider Relations
Date: April 9, 2020
Subject: **COVID-19: Respiratory Volumetric Exercise Protocol**

In continued support of Skilled Nursing Facilities (SNFs), Inland Empire Health Plan (IEHP) is sharing a respiratory therapy resource developed in an acute setting, by respiratory therapy professionals.

The purpose of this resource is to provide pulmonary exercise instructions which will improve lung functions and lessen the progression of COVID-19 infection.

Please review the attached three (3) page resource which addresses the four (4) phases of COVID-19 infection progression, and opportunities to increase positive outcomes.

As a reminder, all communications sent by IEHP can also be found on our Provider portal at: www.iehp.org > For Providers > Plan Updates > Correspondence **or** www.iehp.org > For Providers > Plan Updates > Coronavirus (COVID-19) Advisory.

If you have any questions, please do not hesitate to contact the IEHP Provider Relations Team at (909) 890-2054.

Enclosure: Exercises to Minimize Progression of COVID-19 Infection

Exercises to Minimize Progression of COVID-19 Infection

This proposal is to provide the community with pulmonary exercises to improve lung function, especially an effective cough function to lessen the incidence and progression of COVID-19 infection.

COVID-19 Disease

COVID-19 attaches to the respiratory mucus cell. Consequently, the cell produces thick copious amounts of mucus that is difficult to clear by the lung and even endoscopy, leading to bronchiole obstruction, and in severe cases, respiratory failure.

COVID-19 is similar to respiratory distress in quadriplegics resulting from lung collapse due to mucus plugging because of weak expiratory muscle. Respiratory failure from thick mucus plugging can be treated quickly and successfully with postural drainage and chest physiotherapy.

During the covid-19 pandemic, current protocols are geared towards vaccines, prophylactics, and therapeutics with little geared towards prevention, particularly from non-pharmaceutical practices, aside from social distancing and hygiene. A preventative protocol, which emphasizes exercise can both provide general populations with a sense of practical control and optimism while also boosting natural endorphins for the participating individuals. However, the community, especially debilitated patients, need to have an efficient physiological self-defense to fight COVID-19, which is a strong and efficient cough.

Phases of COVID-19 Disease Progression

According to the CDC there are four phases of progression the COVID-19 infection, mild URI, mild PNA, moderate PNA, and critical respiratory disease.

Pathophysiology of Respiratory Muscle Strength:

Maximal Inspiratory volume reflects diaphragm strength and ventilator ability. Maximum Expiratory Pressure is indicative of abdominal and chest wall muscle strength and the ability to cough and clear secretion. Peak Cough Flow is reported as a simple measurement that indicate the amount of pressure a patient can generate during voluntary cough.

Reports indicate that maximal inspiratory mouth volume and maximal expiratory pressure exclude significant weakness of the respiratory muscles. Patient with a low maximal expiratory pressure have difficulty generating sufficient cough to clear respiratory secretion.

When the FEV1 is greater than 2 liters or 50% of predicted, major complications are rare.

Patient is considered a high risk:

1. If maximal inspiratory mouth volume and maximal expiratory pressure decrease more than 20% below patient's baseline.
2. When the FEV1 becomes less than 2 liters or 50% of predicted

Principal of Chest Physiotherapy

Chest Physiotherapy is essential for management of seriously ill patients with excessive mucous production. Chest physiotherapy, along with postural drainage, enhanced mucus clearance from central and peripheral lung airways. Effective coughing technique enhances sputum expectoration.

Inspiratory and Expiratory (IE) Exercise Program for Individuals

An individual becomes high risk if not able to clear mucus. To prevent decompensation, individuals should practice routine pulmonary exercise training with the goal of achieving increased maximal inspiratory mouth volume for sex, height, and weight, an increased lung volume expiration, and an increased cough capacity.

Training should consist of diaphragm, abdominal, and chest wall strengthening through deep inspiration and expiration, as well as cardio-pulmonary fitness and endurance training.

Inspiratory and Expiratory (IE) muscle strengthening is accomplished through diaphragm, abdominal, and chest wall strengthening exercises through deep inspiratory breathing and exhaling through the same tube over ten seconds in the supine position in a series 10 times per hour, 3 times per day.

General cardio-pulmonary fitness and endurance training is improved or maintained through walking or light jogging to achieve 70% targeted heart rate for 20-30 minutes 2 to 3 times a week. For an individual who might not be able to sustain or tolerate high activity it can be substituted with 2 to 3 minutes of walking or light jogging to achieve 70% targeted hearth rate alternating with equal period of rest, for a cumulative of 30 minutes.

Inclusion:

- Community at large, with and without COVID19 infection
- High risk patients with neuromuscular disease

Exclusion:

- People that are presently being treated for severe respiratory disease
- Individuals with baseline cough and those who cannot do deep breathing
- Individuals with fever greater than 100.4 F due to non-respiratory reasons

Procedure:

1. Identify individuals that meet the inclusion and exclusion criteria and are willing to be in the protocol for 30 days and provide them with an inspirimeter
2. On intake sheet record medical history including any medical conditions, medications, sex, height and weight
3. On intake sheet record whether individual has no fever or cough, or whether the individual is in Phase 1-4 of COVID-19 disease
4. Provide individuals with inspirimeter training; and include slow breathing out exercise through the same tube over 10 seconds
5. 5 minutes after training record baseline inspirimeter volume reading that the large disk moves up on the intake sheet

6. On intake sheet, record daily for 30 days, whether volumetric exercises (inspiration and expiration) were done three times per day, and the highest inspiratory volume readings. There is no recording for exhalation. Exhalation training must be done breathing out slowly through the same tube over 10 seconds. Record if there were more than 5 coughs during the volumetric exercises.
7. Record whether general cardio-pulmonary fitness and endurance training was done that day.
8. Contact primary physician if there is a:
 - a. 20% decrease in the daily highest recorded inspiration volume compared to the baseline number,
 - b. and there has been an interval development of a daily cough not during the volumetric exercises, and fever greater than 100.4 F
9. At the end of 30 days return the intake sheet to the primary physician

Outcomes:

- Determine in the Cohort whether and likelihood that there has been a progression from asymptomatic to which phase of COVID-19 when using IE exercises compared to the local population.
- Determine whether the Cohort of at risk COVID-19 individuals followed daily inspiratory expiratory volumetric exercises and general cardio-pulmonary training.
- Determine the correlation between expected, baseline, and change in inspiratory volume maximum and outcome with IE exercises in the Cohort.

References

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