

# WakeMed Outpatient Pulmonary Rehabilitation and Cardiopulmonary Therapy Protocol

## General Orders

1. Supplemental oxygen to be titrated at any time during the visit to maintain SpO<sub>2</sub> ≥88% unless otherwise specified by the referring physician or medical director.

If patient on home oxygen, start on home dose and titrate as needed to maintain SpO<sub>2</sub> > or = 88%.

If patient not on home oxygen, place on 1LPM O<sub>2</sub> via NC and titrate 1-6LPM to maintain SpO<sub>2</sub> > or = 88% unless otherwise specified by the referring physician or medical director.

Unable to maintain SpO<sub>2</sub> > or = 88% on 6LPM O<sub>2</sub> via NC and patient **is a mouth breather**:

Place on Venturi mask at 35% FiO<sub>2</sub> and titrate up to 50% FiO<sub>2</sub> to maintain SpO<sub>2</sub> > or = 88%.

Unable to maintain SpO<sub>2</sub> > or = 88% at 50% FiO<sub>2</sub> via Venturi mask:

Place on NRB at 10LPM O<sub>2</sub> and titrate 10-25LPM to maintain SpO<sub>2</sub> > or = 88%.

Unable to maintain SpO<sub>2</sub> > or = 88% on 25LPM via NRB, notify physician.

Unable to maintain SpO<sub>2</sub> > or = 88% on 6LPM O<sub>2</sub> via NC and patient **is not a mouth breather**:

Place on Large Bore Low Flow NC at 6LPM and titrate 6-15LPM to maintain SpO<sub>2</sub> > or = 88%.

Unable to maintain SpO<sub>2</sub> > or = 88% on 15LPM via Large Bore Low Flow NC:

Place on Venturi mask at 35% FiO<sub>2</sub> and titrate up to 50% FiO<sub>2</sub> to maintain SpO<sub>2</sub> > or = 88%.

Unable to maintain SpO<sub>2</sub> > or = 88% at 50% FiO<sub>2</sub> via Venturi mask:

Place on NRB at 10LPM O<sub>2</sub> and titrate 10-25LPM to maintain SpO<sub>2</sub> > or = 88%.

Unable to maintain SpO<sub>2</sub> > or = 88% on 25LPM via NRB, notify physician.

2. Supplemental oxygen to be titrated at any time during the visit to maintain SpO<sub>2</sub> ≥90% for patients with a diagnosis of pulmonary hypertension, unless otherwise specified by the referring physician or medical director.

If patient on home oxygen, start on home dose and titrate as needed to maintain SpO<sub>2</sub> > or = 90%.

If patient not on home oxygen, place on 1LPM O<sub>2</sub> via NC and titrate 1-6LPM to maintain SpO<sub>2</sub> > or = 90% unless otherwise specified by the referring physician or medical director.

Unable to maintain SpO<sub>2</sub> > or = 90% on 6LPM O<sub>2</sub> via NC and patient **is a mouth breather**:

Place on Venturi mask at 35% FiO<sub>2</sub> and titrate up to 50% FiO<sub>2</sub> to maintain SpO<sub>2</sub> > or = 90%.

Unable to maintain SpO<sub>2</sub> > or = 90% at 50% FiO<sub>2</sub> via Venturi mask:

Place on NRB at 10LPM O<sub>2</sub> and titrate 10-25LPM to maintain SpO<sub>2</sub> > or = 90%.

Unable to maintain SpO<sub>2</sub> > or = 90% on 25LPM via NRB, notify physician.

Unable to maintain SpO<sub>2</sub> > or = 90% on 6LPM O<sub>2</sub> via NC and patient **is not a mouth breather**:

Place on Large Bore Low Flow NC at 6LPM and titrate 6-15LPM to maintain SpO<sub>2</sub> > or = 90%.

Unable to maintain SpO<sub>2</sub> > or = 90% on 15LPM via Large Bore Low Flow NC:

Place on Venturi mask at 35% FiO<sub>2</sub> and titrate up to 50% FiO<sub>2</sub> to maintain SpO<sub>2</sub> > or = 90%.

Unable to maintain SpO<sub>2</sub> > or = 90% at 50% FiO<sub>2</sub> via Venturi mask:

Place on NRB at 10LPM O<sub>2</sub> and titrate 10-25LPM to maintain SpO<sub>2</sub> > or = 90%.

Unable to maintain SpO<sub>2</sub> > or = 90% on 25LPM via NRB, notify physician.

3. Respiratory Therapist to administer prescribed inhaled medications as clinically indicated during the course of therapy unless otherwise specified by the referring physician or medical director.

## Shortness of Breath, Chest Pain, or other abnormal symptoms

Patient complains of any one of the following: pain in chest, jaw, or neck; chest pressure; substernal pressure; pain radiating to upper extremity; nausea; cold sweating at rest.

1. Obtain blood pressure, pulse, and oxygen saturation.

If BP > 180/110 at rest, HR > 130 at rest for 5 minutes, or SpO<sub>2</sub> < 88% (< 90% for patients with a diagnosis of pulmonary hypertension) at rest, activate emergency response.

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2. If BP < 180/110 at rest, HR < 130 or baseline at rest, and SpO<sub>2</sub> > or = 88% (> or = 90% for patients with a diagnosis of pulmonary hypertension) at rest, but chest pain symptoms persist, contact on call pulmonary consulting physician.
3. If BP < 180/110 at rest, HR < 130 or baseline at rest, and SpO<sub>2</sub> > or = 88% (> or = 90% for patients with a diagnosis of pulmonary hypertension) at rest, and symptoms completely resolve with rest, no further exercise that session, notify referring physician and advise patient to follow up with physician as soon as possible.

Patient has 1 or more of the following signs or symptoms that are not the patient's baseline: chest pain that is low suspicion for cardiac origin (sharp or knifelike pain brought on by breathing or coughing, sudden stabbing pain that lasts only a few seconds, pain clearly on one side or the other, pain confined to one small spot, pain that lasts for many hours or days without any other symptoms, pain reproduced by pressing on the chest or with body movement, pain that is not changed with activity), increased respiratory effort (eg: nasal flaring, retractions), inadequate respiratory effort (eg: hypoventilation or RR < 6), abnormal airway sounds on auscultation (eg: stridor, wheezing, grunting), pale, cool skin, warm/red skin, diaphoretic, changes in level of consciousness, agitation, use of abdominal muscles to assist in breathing, dizziness, lightheadedness, abnormal weakness: .

1. Obtain blood pressure, pulse, and oxygen saturation.
2. Administer and titrate supplemental oxygen as indicated per above guidelines
3. If symptoms resolve with rest after 5 minutes and BP < 180/110, HR > 50 but < 130 or baseline, and SpO<sub>2</sub> > or = 88% (> or = 90% for patients with a diagnosis of pulmonary hypertension), the patient may resume low intensity exercise. Notify referring physician.
4. If symptoms are unresolved or worsening after 5 minutes rest but vital signs are BP < 180/110, HR > 50 but < 130 or baseline, and SpO<sub>2</sub> > or = 88% (> or = 90% for patients with a diagnosis of pulmonary hypertension), contact on call pulmonary consulting physician.

## Glucose Testing

Patient complains of or exhibits 1 or more signs or symptoms of hypoglycemia (shakiness; nervousness or anxiety; sweating, chills, and clamminess; HR > 130 at rest; lightheadedness or dizziness; headache; hunger; irritability; tingling or numbness of tongue or lips) or displays altered mental status.

1. For patients with no history of diabetes:
  - a. Patient will perform glucose test with their own glucometer. If the patient does not have a glucometer, or the reading is <70 mg/dL, then perform POC glucose test.
  - b. For Blood Glucose (BG) < 70 mg/dL and patient is able to consume carbohydrates orally:
    - i. Treat with 30 grams fast acting carbohydrate (8 oz. juice). Perform POC glucose test in 15 minutes.
    - ii. If BG <70 mg/dL, treat with 15 grams of fast-acting carbohydrate (4 oz. juice). Repeat this step every 15 minutes until BG ≥70 mg/dL.
    - iii. Once BG ≥ 70 mg/dL, patient should consume a meal or snack. (2 graham crackers and 1 oz. peanut butter).
    - iv. If BG does not respond to treatment, contact on call consulting pulmonary physician.
    - v. If patient symptoms increase or patient becomes otherwise unstable, activate emergency response.
  - c. For BG < 70 mg/dL and pt. is unable to consume carbohydrates orally:
    - i. Contact on call consulting pulmonary physician.
    - ii. If patient symptoms increase or patient becomes otherwise unstable, activate emergency response.
2. For patients with a history of diabetes:

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WakeMed Rehab

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1. Patient will report most recent blood glucose (BG) taken prior to arrival. If patient cannot remember previous BG, then have patient re-check BG. If patient does not have their own glucometer with them, perform POC glucose test.
  - a. If reported BG <100mg/dl and patient has not eaten since, have patient re-check BG. If patient does not have their own glucometer with them, perform POC glucose test.
    - i. BG is 70-100mg/dl and patient able to consume carbohydrates orally:
      - Give patient snack prior to initiating exercise (2 graham crackers and 1 oz. peanut butter).
    - ii. BG is < 70mg/dl and patient able to consume carbohydrates orally:
      - Treat with 30 grams fast acting carbohydrate (8 oz. juice). Perform POC glucose test in 15 minutes.
      - If BG <70 mg/dL, treat with 15 grams of fast-acting carbohydrate (4 oz. juice). Repeat this step every 15 minutes until BG >70 mg/dL.
      - Once BG > 70 mg/dL, patient should consume a meal or snack. (2 graham crackers and 1 oz. peanut butter).
      - If BG does not respond to treatment, contact on call consulting pulmonary physician.
      - If patient symptoms increase or patient becomes otherwise unstable, activate emergency response.
  - b. If reported BG ≥ 300mg/dl, have patient re-check BG.
    - i. Patient using own glucometer and BG ≥300mg/dl on re-check:
      - Perform POC glucose test.
      - If ≥300mg/dl, patient may not exercise this session. Notify physician.
      - If patient is symptomatic (increased thirst, headaches, trouble concentrating, blurred vision, frequent urination), contact on call pulmonary consulting physician prior to allowing patient to leave facility.
    - ii. Patient using own glucometer and BG ≥400mg/dl on re-check:
      - Perform POC glucose test.
      - If ≥400mg/dl, or if patient is symptomatic (increased thirst, headaches, trouble concentrating, blurred vision, frequent urination), contact on call pulmonary consulting physician.
    - iii. Patient does not have own glucometer with them perform POC glucose test.
      - If ≥300mg/dl, patient may not exercise this session. Notify referring physician.
      - If ≥400mg/dl, or if patient is symptomatic (increased thirst, headaches, trouble concentrating, blurred vision, frequent urination), contact on call pulmonary consulting physician.

**Patient complains of any of the following: acute onset shortness of breath, new HR > 130 at rest, acute hypotension (BP < or = 90/60), or demonstrates acute significant drop in SpO2 without recovery (< 88% after titration, or < 90% after titration for patients with a diagnosis of pulmonary hypertension).**

1. Assess patient for: sense of impending doom, chest pain, hemoptysis, cyanosis or cool clammy skin, diaphoresis, lightheadedness/dizziness, complaint of hot flash feeling.

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2. Obtain blood pressure, pulse, and oxygen saturation and titrate supplemental oxygen as below to maintain SpO<sub>2</sub> ≥ 94%:

If patient on home oxygen, titrate as needed to maintain SpO<sub>2</sub> > or = 94%.

If patient not on home oxygen, titrate O<sub>2</sub> via NC 1-6LPM to maintain SpO<sub>2</sub> > or = 94%

Unable to maintain SpO<sub>2</sub> > or = 94% on 6LPM O<sub>2</sub> via NC and patient **is a mouth breather**:

Place on Venturi mask at 35% FiO<sub>2</sub> and titrate up to 50% FiO<sub>2</sub> to maintain SpO<sub>2</sub> > or = 94%.

Unable to maintain SpO<sub>2</sub> > or = 94% at 50% FiO<sub>2</sub> via Venturi mask:

Place on NRB at 10LPM O<sub>2</sub> and titrate 10-25LPM to maintain SpO<sub>2</sub> > or = 94%.

Unable to maintain SpO<sub>2</sub> > or = 94% on 25LPM via NRB, notify physician.

Unable to maintain SpO<sub>2</sub> > or = 94% on 6LPM O<sub>2</sub> via NC and patient **is not a mouth breather**:

Place on Large Bore Low Flow NC at 6LPM and titrate 6-15LPM to maintain SpO<sub>2</sub> > or = 94%.

Unable to maintain SpO<sub>2</sub> > or = 94% on 15LPM via Large Bore Low Flow NC:

Place on Venturi mask at 35% FiO<sub>2</sub> and titrate up to 50% FiO<sub>2</sub> to maintain SpO<sub>2</sub> > or = 94%.

Unable to maintain SpO<sub>2</sub> > or = 94% at 50% FiO<sub>2</sub> via Venturi mask:

Place on NRB at 10LPM O<sub>2</sub> and titrate 10-25LPM to maintain SpO<sub>2</sub> > or = 94%.

Unable to maintain SpO<sub>2</sub> > or = 94% on 25LPM via NRB, notify physician.

3. If BP < 180/110, HR < 130 or baseline, and SpO<sub>2</sub> > or = 94%, contact on call pulmonary consulting physician.

4. If BP > 180/110 at rest, HR > 130 at rest for 5 minutes and SpO<sub>2</sub> < 94%, or if symptoms worsen, activate emergency response.

## Hypertension (BP > or = 180/110)

1. If systolic blood pressure (SBP) ≥ 200 mmHg or diastolic blood pressure (DBP) ≥ 120 mmHg at check in, allow patient to rest at least 5 minutes and re-check BP. If BP remains elevated, SBP ≥ 200 or DBP ≥ 120, contact on call pulmonary consulting physician.

2. If SBP ≥ 180 mmHg or DBP ≥ 110 mmHg at check in, allow patient to rest for 5 minutes and re-check BP.

a. If BP remains elevated, SBP ≥ 180 or DBP ≥ 110:

i. If patient took antihypertensive agent prior to arrival (last dose of prescribed regimen), re-check BP every 10 minutes until BP decreases, SBP < or = 180 or DBP < or = 110, up to 30 minutes.

1. If BP remains elevated, SBP ≥ 180 or DBP ≥ 110 after 30 minutes, patient may not exercise that session. Notify physician.

ii. If patient did not take antihypertensive agent prior to arrival (last dose of prescribed regimen), allow patient to rest for an additional 10 minutes.

1. If BP remains elevated, SBP ≥ 180 or DBP ≥ 110, patient may not exercise that session. Notify physician.

3. If patient exhibits any one of the following (headache, lightheadedness, dizziness, chest pain, chest pressure) at any point, contact on call pulmonary consulting physician.

4. If > 180/110 at rest, HR > 130 at rest for 5 minutes and SpO<sub>2</sub> < 88% (<90% for patients with a diagnosis of pulmonary hypertension) at any point, activate emergency response.

**Signature of the referral to pulmonary rehab indicates that the referring provider has reviewed and agreed to this protocol and has included any additional specific instructions on the order form.**

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