Oxygen Therapy, Long Term Care

Site Applicability

PHC Long Term Care

Practice Level

Basic Skill: Registered Nurse (RN)/Registered Psychiatric Nurse (RPN)

Licensed Practical Nurse (LPN):

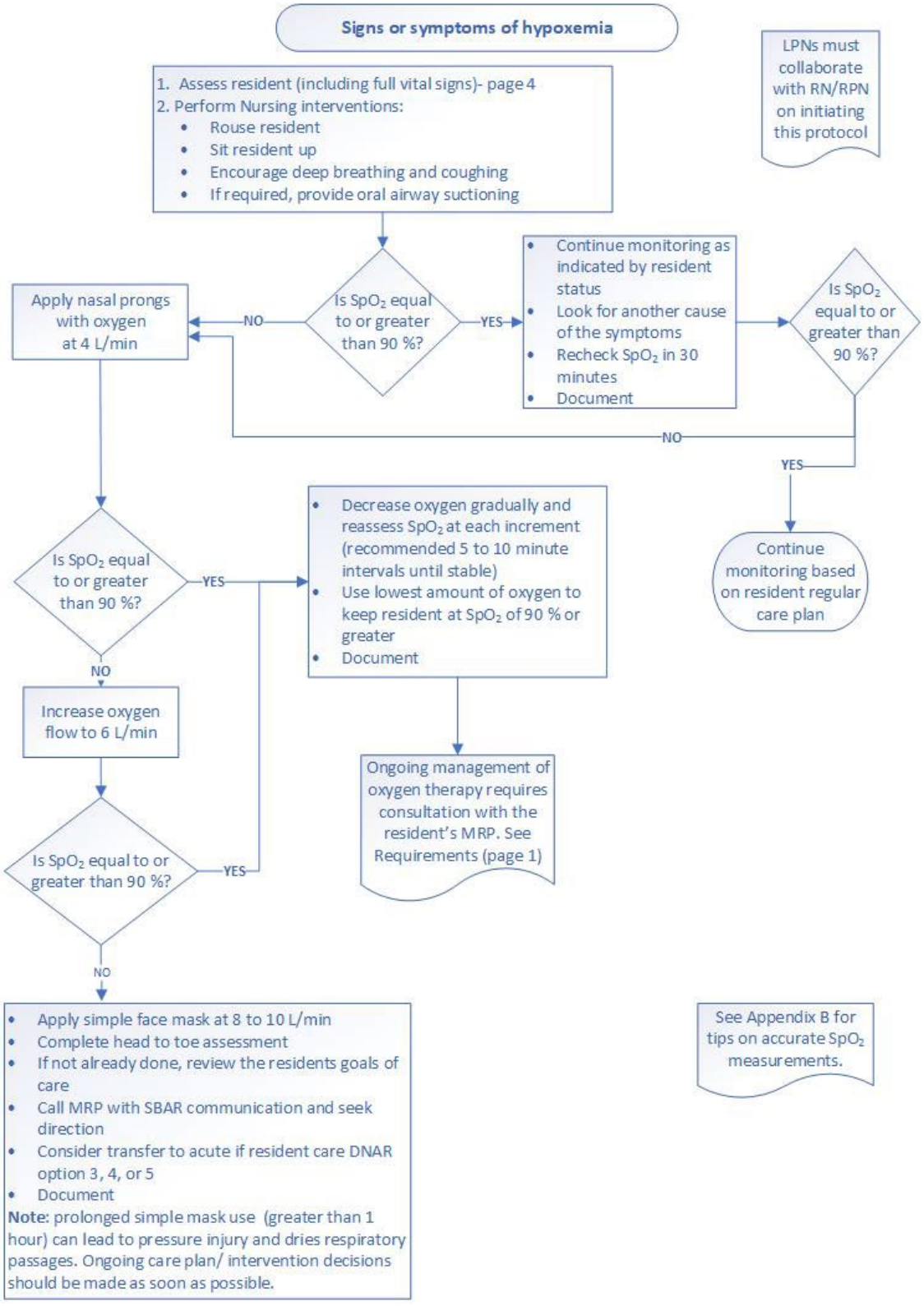
- Must follow this decision support tool AND complete additional education during general orientation.
- Collaboration with an RN/RPN is required when initiating oxygen therapy.

RCA: See Appendix A for Resident Care Aid (RCA) role in oxygen therapy.

Requirements

1. Nurses will initiate assessment of residents experiencing hypoxemia. When indicated, nurses will start treatment of hypoxemia through administration of oxygen. Ongoing management of oxygen therapy requires consultation with resident's Provider.
2. Providers should be consulted to assess and treat underlying cause of hypoxemia and /or provide direction for ongoing management, including target SpO_2 when:
    a. Oxygen requirements are ongoing beyond the length of the shift.
    b. Underlying cause of hypoxemia is not known.
    c. Oxygen requirements exceed capacity of the available equipment in long term care.
    d. Any other concerns regarding resident condition.
3. Decision to transfer resident to higher level care should be made by health care team in collaboration with resident/ family and consider resident goals of care.
4. Nurses will update the Care Plan and Care guide with any changes to the prescribed oxygen flow rate.

Algorithm



Need to Know

- Hypoxemia (low level of oxygen in the blood) is considered an urgent condition for the resident. Untreated hypoxemia can lead to hypoxia (insufficient oxygen in the tissues) and can be life threatening .
- Oxygen is administered to treat hypoxemia/hypoxia at the lowest concentration required to maintain oxygen saturation levels equal to or greater than 90% (or as prescribed).
- COPD is not a contraindication to oxygen therapy, maintain oxygen saturation levels equal to or greater than 88% (or as prescribed). Consult physician orders for resident specific target SpO_2 if present.
- Use caution administering oxygen therapy to residents receiving bleomycin, mitomycin (chemotherapeutics) or cyclophosphamides as they may predispose individuals to experience oxygen induced lung injury at lower levels of administration.
- Oxygen is a fire hazard when used in the presence of an open flame, high heat source and cigarettes.
- Oxygen cylinders should be maintained or stored in a secured and upright position. For safety, **tanks should not be left free standing at any time.**
- Nasal Cannula can be put in the mouth if the nares are not an appropriate option. Do not switch over to a simple mask if resident requires less than 6 LPM.
- Supplemental oxygen therapy has risk for potential harm (e.g. damage from oxygen free radicals and increased systemic vascular resistance).
- Nurses may miss signs of clinical deterioration if oxygen is initiated without appropriate assessment monitoring post initiation.

The following signs and symptoms are indicative of **hypoxemia.**

System	Signs and Symptoms
Neurological	Restlessness/agitation Anxiety/apprehension Inability to concentrate Fatigue Dizziness Decreased level of consciousness
Respiratory	SpO_2 less than 90% (or otherwise indicated) Shortness of breath Use of accessory muscles Decreased or adventitious lung sounds Increased respiratory rate (especially if over 30)

Cardiovascular	Increased heart rate, dysrhythmias Increased blood pressure (initial response)
Other	Pallor Cyanosis Diaphoresis

Protocol

Resident with signs or symptoms of hypoxemia:

Initial Assessment:

- Rate, depth of respirations, presence of dyspnea
- Chest expansion - symmetry and quality
- Cough, presence and quality of sputum
- Use of accessory muscles
- Vital signs including oxygen saturation via pulse oximeter– refer to Appendix B
- Breath sounds: Auscultate anterior and posterior lung fields

Follow algorithm and titrate to lowest dose of oxygen to meet goal SpO_2 90%

Ongoing – for residents on a stable rate of oxygen therapy

1. Assessment of resident every shift
   - Respiratory rate, effort, and colour. Full vital signs including chest auscultation *if indicated* by change in resident condition.
   - Skin condition of resident's nares and ears

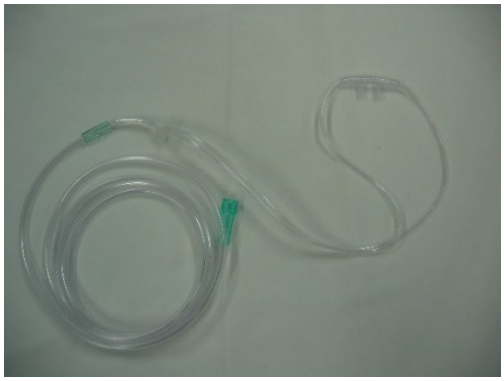
2. Assess equipment on initial application, every shift and as needed. This function can be performed by an RCA in long term care.
   - Applied correctly to resident (e.g. prongs in both nares).
   - Tubing connected to tank or concentrator.
   - Oxygen flowing from tubing.
   - If using portable O_2 there is sufficient reserve in the tank. Refer to Appendix C
   - If using concentrator, air filter is clean.
   - Check for correct setting of flow rate. (This function must be double checked by a nurse).

Equipment

Routine Oxygen Delivery Devices

- Routine oxygen delivery devices are disposable.
- Nurses may set up the following equipment:

1 to 6 Litres per minute (L/min)

Nasal Cannula 	• Used to administer oxygen 1 to 6 L/min. If more than 6L/min required another delivery device should be chosen. • Extension tubing available. Do not use more than four lengths of extension tubing together. • Humidification is not required

6 to 10 LPM

Simple Mask 	• **Only** applied as short-term interim measure. Assess goals of care and consult with provider to determine further action (e.g. transfer to emergency). • Apply simple mask and adjust flow to 10 L/min. • DO NOT WEAN to flow less than 6 L/min ○ Low flow rates can be associated with carbon dioxide accumulation and hypercapnia • For use with oxygen cylinders or wall oxygen. • Do NOT use with oxygen concentrators.

Types of Oxygen Delivery Systems	
Oxygen Concentrator 	• Machine concentrates oxygen from room air. • Provides cost effective delivery of low flow oxygen. • Maximum flow rate is 10 L/min. • Not easily portable. Extension tubing can be used but nurse must be careful that it does not become a tripping hazard. • Concentrator must be plugged in to electrical outlet to work. • Air filter requires regular cleaning by washing and air-drying.
Compressed Oxygen (Grab n Go cylinder) 	• Lightweight aluminum cylinder (silver colour with green top) • Should be maintained or stored in a secured and upright position. • Must make sure that there is enough reserve oxygen in cylinder (see Appendix C). **Cylinders should not be left free standing at any time, knocking them over can cause the pressurized oxygen to escape rapidly, projecting the cylinder.**
Liquid Oxygen systems 	• Not standard in LTC, but some residents provide their own system. • Best choice for portability and allows resident to be more mobile. • Small shoulder packs are filled from a large reservoir. • Staff need to know how to fill shoulder packs from central reservoir. Be careful to hold connection tightly together when filling to prevent frost accumulating.

Documentation

Using site-specific system (interdisciplinary notes, electronic medical record), document:

- Initial assessment - Resident's assessment findings including blood pressure, pulse, respiratory rate, oxygen saturation and chest auscultation.
- Diagnosis of hypoxemia.
- If new therapy, document date and time oxygen therapy initiated - Included method of oxygen delivery (nasal prongs or simple mask) and flow rate in L/min.
- Resident response to starting of oxygen therapy. This would include O_2 saturation and vital signs.
- Teaching given to resident.
- Date, time and outcome of consultation with provider regarding orders for ongoing oxygen therapy and management.
- Any change in delivery rate as a result of titrating the rate up or down including the rationale for doing so.

Resident and Family Education

- Explain the purpose of oxygen therapy.
- Ask to call nurse if concentrator beeps or becomes unplugged, tubing becomes disconnected or no air seems to be coming out. Also call the nurse if the "sound" of the concentrator running has stopped.
- Ask to call nurse if tubing becomes disconnected or there appears to be no oxygen flowing out of the oxygen tank.
- Provide written teaching material where appropriate.
- Inform resident, family and visitors of safety precautions while on oxygen including avoiding open flames or smoking.
- Provide written resident teaching material where appropriate.
- Inform resident and visitors of safety precautions while on oxygen.

Related Documents

B-00-07-13080 – Aerosol Generating Medical Procedures (AGMP) in the context of COVID- Infection Prevention and Control

References

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Appendices

- Appendix A: Resident Care Aide (RCA) Role
- Appendix B: Pulse Oximetry Tips and Techniques
- Appendix C: Oxygen Cylinder Reserve

Appendix A: Resident Care Aide (RCA) Role

1. In urgent situations:
    - RCA collects equipment as directed by a nurse. Nurses assesses and monitors resident.
2. For residents receiving continuous oxygen:
    - RCA ensures the device is applied correctly (e.g. prongs in both nares).
    - RCA routinely monitors oxygen delivery equipment to ensure tubing is free from kinks and connected to the oxygen delivery device.
    - Informs the nurse if equipment is not working or not being used by resident.
    - RCA may change resident receiving continuous oxygen via a concentrator to “Grab ‘N Go” cylinder or from “Grab ‘N Go” cylinder back to concentrator. Must ensure that the rate of flow is the same on both the original and new system. Must ask nurse to double check the rate.
    - Monitors level of oxygen in “Grab ‘N Go” tanks and changes tank when the indicator is in the red zone (500 psi or less).
    - Changes nasals prongs and cleans the filter on oxygen concentrator on resident bath day.
3. For residents receiving intermittent oxygen therapy:
    - RCA **may not** start or stop oxygen therapy.
    - RCA **may not** adjust rate of oxygen flow. RCA must inform the nurse if a resident requests start or stop of oxygen.

Appendix B: Pulse Oximetry Tips and Techniques

- Ensure resident is not moving the limb with the oximeter probe (motion artifact).
- Do not obtain measurements on the arm with the BP cuff in use.
- Ensure that the red light is lit in the sensor.

- When using a Dinamap monitor, the signal strength indicator flashes red when pulse rate measurements are being derived from SpO_2 signals and the height of the bar is proportional to the arterial blood flow.

- Vasculopathy, hypotension, poor peripheral perfusion – may not obtain an oximetry measurement; measurements obtained may not be accurate.
- Ensure probe on resident for 30 to 60 seconds, and that the saturation reading is in a steady-state and not fluctuating before recording measurement.
- Dark nail polish may interfere with saturation measurement or indicate a false value.
- May need to try various sites before a reliable saturation is obtained (fingers, toes, earlobes). Consider wrapping hands in warm blanket.
- ***Use clinical assessment skills*** Is the saturation value obtained consistent with the resident's presentation?

Appendix C: Oxygen Cylinder Reserve

	Gauge Pressure (psi)			
Flow (L/min)	**2000 psi**	**1500 psi**	**1000 psi**	**500 psi**
0.5	22.5 hours	16.5 hours	11 hours	5.25 hours
1	10.5 hours	7.75 hours	5 hours	2.25 hours
1.5	7 hours	5 hours	3.25 hours	1.25 hours
2	5 hours	3.5 hours	2.25 hours	1 hour
3	3.25 hours	2 hours	1.25 hours	45 min
4	2.25 hours	1.5 hours	1.17 hours	35 min
6	1.56 hours	1.17 hours	47 min	---
8	1.17 hours	53 min	35 min	---
15	37 min	---	---	---

*All times are approximate & are calculated allowing for approximately 30-minute buffer

Persons/Groups Consulted:

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