CLINICAL GUIDELINE

OXYGEN THERAPY	
Applicable to: **MidCentral Health (Provider Division)**	Issued by: **Respiratory Services**
	Contact: **Respiratory Physician**

1. PURPOSE

Safe and efficient administration of oxygen.

2. SCOPE

Applies to all MCH Medical and Nursing staff who involves in oxygen delivery services to patients.

3. ROLES & RESPONSIBILITIES

3.1 Medical

- A working knowledge of oxygen delivery services, their role and shortcomings and the management of hypoxemic patients.
- A working knowledge of the roles and side-effects of oxygen therapy and what remedial action to take.
- A knowledge of oximetry and arterial blood gas analysis for assessing response to oxygen therapy.

3.2 Nursing

- To be able to recognise the different oxygen delivery devices and to know what concentration of oxygen they are capable of delivering.
- To recognise hypoxemia clinically, to alert medical staff as to its possible presence.
- Respiratory nursing team will assess patient for appropriateness of domiciliary oxygen referral to ensure issues such as compliance, prescription, home environment are adhered to before final decision is made.

4. PREREQUISITES

Oxygen source, oxygen delivery devices.

5. CLINICAL GUIDELINE

Health and Safety

People who smoke are excluded from domiciliary oxygen supply because they risk burns, fires and explosions and because smoking off-sets the treatment benefit.

All patients are educated on the risk of oxygen and how to use it safety. Written information is supplied in MidCentral Health's "A Guide to Home Oxygen Therapy" (Communications Ref.:0969).

- No oil, grease or petroleum based products on or near the unit.
- No oil based lotions on the face or on hands when handling equipment.
- No smoking in the same room as this unit or client on oxygen.
- Do not place nasal cannula under any bedding while unit is running. This will cause bedding to become flammable.

5.1 Indications

Either

1) **<u>Hypoxemia</u>** PaO_2 < 60mmHg or SaO_2< 91%

   Or

2) **<u>Tissue oxygenation inadequate or threatened</u>** eg sepsis, trauma, post operative, acute myocardial infarction, acute asthma (need to take clinical situation into account).

Service or Unit specific guidelines/protocols should be followed as appropriate.

- Oxygen is **<u>not</u>** given for breathlessness **<u>unless it is shown</u>** to be associated with hypoxemia.
- Because of the shape of the oxygen dissociation curve in a **stable patient** there is little to be gained by increasing the PaO_2 above 60mmHg (or $Sa0_2$ > 91%) as there will be very little extra oxygen actually added (O_2 content).

5.2 Methods of Oxygen Administration

Oxygen is considered a medication and must be prescribed and signed by a Medical Officer on the prescription sheet. Either the oxygen percentage or the device (mask/nasal cannula) with flow rate must be included. **The flow rate must be accurately set from wall mounted flow meters - read instructions on the meters.**

5.2.1 Simple Mask

(Hudson) (>4-10 L/min):

- Most useful for acute Hypoxemia in which an accurate FIO2 is not required. (eg acute LVF, asthma, shock, PE, trauma, pneumonia etc.)
- Not suitable for low FIO2.
- Should not use at flow rates less than 4 L/min.

Flow Rate	Approximate O_2 Concentration
4 L/min	35%
6 L/min	43%
8 L/min	50%
10 L/min	58%
12 L/min	65%
14 L/min	72%

5.2.2 Nasal Cannula

(1-4 litres/min):

- Most comfortable for patients.
- Useful for mild hypoxemia.
- Patient will not tolerate high flow (above 4 L/min).
- Most patients can be adequately treated using these.
- Used for chronic domiciliary oxygen administration.

Flow Rate	Approximate O_2 Concentration
1.0 L/min	24%
1.5 L/min	30%
2.0 L/min	34%
2.5 L/min	38%
3.0 L/min	40%

5.2.3 Venturi Masks (Multivent, Ventimask)

(Variable Flows)

with these masks oxygen is delivered at a fixed flow rate (usually 6-8 l/min, depending on the make) into the mask. Air is entrained through a hole in the side of the mask to mix with and dilute the oxygen to the desired concentration. By varying the size of the hole the final concentration of oxygen can be changed. Most Venturi masks can deliver concentrations between 24-60%% of oxygen. They can give accurate concentrations of oxygen and are therefore useful for giving controlled, low flow, oxygen therapy in those patients at risk of cO_2 retention.

5.2.4 High Flow Humidified Circuits

(up to 30L/min)

these are used in critically ill patients who require both high concentrations of oxygen and humidification of gases (see 5.5). These circuits are the only means by which humidified oxygen can be effectively administered and also give an accurate variable flow of oxygen as required. The circuits are available by contacting the equipment loan store.

5.2.5 High Concentration Reservoir Masks

A 750ml reservoir bag is added to the system to increase the amount of pure oxygen the patient can breathe. Use the flow rate necessary to keep the reservoir bag well inflated and to prevent the bag deflating more than one third when the patient inhales. Recommended flow rates are 10-15 l/min which delivers oxygen concentrations of 60-90%.

5.3 Monitoring

The effect of supplementary oxygen **must be monitored with Pulse Oximetry, Respiratory Rate and close observation of the patient. ABG's should be measured on arrival to hospital for most patients requiring emergency oxygen therapy and in all cases of hypercapnia and acidosis**. The frequency of ABG's depends on the clinical circumstances and the patients response to treatment. Patients at risk of hypercapnia require a repeat ABG estimation 30-60 mins after an increase in oxygen. Usually aim to increase the PaO2 to above 60mmHg or saturation to above 91%. If patients have COPD with a history of respiratory failure or other risk factors for hypercapnic respiratory failure, aim to achieve a saturation of 88-92% pending ABG results.

5.4 CO2 Retention

Uncommon and usually associated with chronic lung disease.

Patients at risk can usually be identified from old notes. If at risk (chronic airflow obstruction with increased CO2) commence oxygen at 24% via Multivent mask, monitor ABG's after 30-60 minutes, and increase FIO2 gradually as tolerated. Monitoring with ABG's aiming for PaO2 of 55-60mmHg. A compromise maybe required if the PaO2 is unable to be raised to 55-60mmHg without an increase in PaCO2 and patient not a candidate for ICU/Ventilation. Remember that the patient has probably had a low PaO2 for some days and survived. If narcotic levels of CO2 do occur do not reduce the inspired oxygen without careful monitoring as profound and potentially fatal hypoxemia may result.

5.5 Humidification

Humidification of the oxygen is usually not required. Special circumstances usually include patients on long term high flow oxygen, e.g. tracheotomy, pneumonia with scanty tenacious secretions, intubation, and interstitial lung disease.

Wall mounted bubble chambers are ineffective and should not be used. Heated water chambers probably are effective at lowish flow rates.

5.6 Domiciliary Oxygen Therapy

5.6.1 Indications

1) Chronic airflow obstruction with hypoxemia (PaO2<55/60mmHg), or chronic airflow obstruction with Cor pulmonale.
2) Other pulmonary diseases with hypoxemia.
3) Precipitous life threatening asthma.
4) End stage cardiac disease.
5) Palliation of terminal illnesses.

5.6.2 Notes for Chronic Respiratory Patients

1) Before being assessed for domiciliary oxygen, patients must have been optimally treated and in a **stable clinical state.**
2) Oxygen is NOT given for breathlessness.
3) Smoking is an absolute contraindication to oxygen therapy.
4) The flow rate, method of administration and timing of administration must be clearly determined.
5) The patient should be monitored regularly.

5.6.3 Notes for Palliative Care Patients

Oxygen therapy is prescribed for palliation on terminally ill patients, usually with cancer or other causes of disabling dyspnoea. The therapy is for the management of dyspnoea and in adequately controlled on narcotics/anxiolytics and with oxygen saturation levels of <90% on air.

5.6.4 Requesting Domiciliary Oxygen

Domiciliary oxygen therapy **MUST** be requested by a Physician or Paediatrician. Respiratory Physician at Respiratory Services, Palmerston North Hospital will authorise requests.

Prior **notification** to the Respiratory Nurse Specialist, Respiratory Services, Palmerston North Hospital, is necessary at least **two working days** prior to discharge, or requirement for delivery. Provision of this service requires planning and patient education.

A completed Supply of Domiciliary Oxygen Request Form is faxed to Respiratory Services, 350 8647, one day prior to discharge.

6. REFERENCE

1. Driscoll, B., Howard, L. & Davison, A.,(2008), BTS guideline for Emergency Oxygen Use in Adult Patients. *Thorax, 63. 1-68*
2. McDonald, C., Cockett, A & Young, I., (2005)., Adult Domiciliary Oxygen Therapy Position Statement of the Thoracic Society of Australia and New Zealand.

7. APPENDICES

Appendix	Ministry of Health "Notice of Potential Medically Dependent Consumer (MDC) Status"

8. RELATED MDHB DOCUMENTS

MDHB-769	Oxygen - Home & Palliative Care Requests [Form]
MDHB-1079	Arterial Blood Gas Interpretation [Resource Document]
MDHB-2654	Commencing Bi-Level Ventilation in Medical HDU [Resource Document]

A Guide to Home Oxygen Therapy (Communications Ref: 0969)

9. FURTHER INFORMATION / ASSISTANCE

Respiratory Physicians - Respiratory Services
Respiratory Clinical Nurse Specialist - Respiratory Services

10. KEYWORDS

Oxygen, Hypoxemia, Oxygen masks

Appendix

Notice of Potential Medically Dependent Consumer (MDC) Status[1]

To the Patient

Please pass this form onto your electricity provider.
Hoatu te puka nei ki tō kaiwhakarato hiko.
Fa`amolemole `ave lenei pepa i le kamupanī `olo`o sapalai maia lau `eletise.
Kātaki 'o 'ave 'a e foomu ko 'eni ´ ki he kautaha 'oku mou ma'u 'uhila mei ai ´.
Me ka tika, tukuia atu teia fōmu ki toou ona ūira.
请把本表交给您的电力供应商。

PART A - PATIENT DETAILS

Patient's name: _____

Patient's date of birth: _____

Patient's contact phone number(s):
_____(h) _____(m) _____(w)

Caregiver's contact phone number(s) – *if different from patient's*:
_____(h) _____(m) _____(w)

Full physical address (*PO Box or RD is not acceptable*) where the patient will reside on discharge (Residence):
_____
_____
_____

Name(s) of electricity account holder(s) at residence where the patient will reside on discharge:
_____ _____ _____

Contact phone number(s) of electricity account holder(s):
_____(h) _____(m) _____(w)

Residence's electricity ICP number (*this can be found on the residence's electricity bill – usually up to 15 characters*): _____

Residence's electricity account number (*this can be found on the residence's electricity bill*):
_____

[1] As per the definition within the *Guideline on arrangements to assist medically dependent consumers.*

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_____
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_____ _____ _____

Contact phone number(s) of electricity account holder(s):
_____(h) _____(m) _____(w)

Residence's electricity ICP number (*this can be found on the residence's electricity bill – usually up to 15 characters*): _____

Residence's electricity account number (*this can be found on the residence's electricity bill*):
_____

[1] As per the definition within the *Guideline on arrangements to assist medically dependent consumers.*

Consent: - As the recipient of this medical equipment and a potentially medically dependent consumer, I consent to the information on this form and information on the future status of my dependence on the medical equipment to be shared between the health practitioner(s), electricity retailer(s) and/or the electricity account holder for the domestic residence where I will be residing, for the purpose of ensuring that the electricity retailer is informed of my medical dependence on electrical equipment and my status as a medically dependent electricity consumer. The electricity retailer may use this information to identify residences where electricity disconnection, for whatever reason, may have significant consequences.

Patient signature: _____ Date: _____

and/or

Caregiver signature: _____ Date: _____

PART B - CONFIRMATION THAT ELECTRICITY IS REQUIRED

I certify that _____ (patient's name) with NHI number _____ is:

(i) using mains electricity dependent critical electrical medical equipment (CEME); and

(ii) at some point in the future may be dependent on the CEME to the extent that disconnection may result in loss of life or serious harm. (If so, the patient is a potentially medically dependent consumer (of electricity)[2].)

I also certify that the patient listed above has been provided knowledge, training and support, in accordance with appropriate clinical practice:

(i) for the use of the CEME; and

(ii) what to do in an emergency, including when the supply of electricity may be interrupted for any reason.

Where:

(i) Critical medical support is defined as support which, in the opinion of a DHB, private hospital or GP, is required to prevent loss of life or serious harm; and

(ii) CEME is defined as any equipment supplied or prescribed by a DHB, private hospital or GP, which requires mains electricity to provide critical medical support to a person, and includes other electrical equipment needed to support either the CEME or the treatment regime (e.g. a microwave to heat fluids for renal dialysis).

Note: The patient's electricity retailer may seek advice on the patient's status as a MDC if at any point in the future the patient faces disconnection.

Date: _____

Name of DHB/private hospital/GP:

[2] As defined in the Electricity Commission's *Guideline on arrangements to assist medically dependent consumers* (March 2010).

_____

Name of the health practitioner treating the patient (including designation):

_____

Signature of the health practitioner treating the patient:

_____

OR

Name and designation of another health practitioner, signing on behalf of the health practitioner treating the patient:

_____

Signature:

_____

Contact number and/or email address of signatory:

_____

Disclaimer: The DHB/private hospital/GP/issuer of this Notice of Potential MDC Status on behalf of the patient, takes no responsibility for any debts incurred by the patient in relation to transactions or arrangements entered into by the patient with the electricity retailer.