THE LINDE GROUP

Chronic Obstructive Pulmonary Disease (COPD).

A pocket guide for healthcare professionals.

Linde: Living healthcare

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COPD – the facts

- Moderate to severe COPD affects 65 million people worldwide and accounts for 5% of all deaths.[1]
- COPD is the fourth leading cause of death, and is forecast to become the third by 2030.[1,2]
- COPD is the leading cause of lost work days among respiratory diseases.[3]
- Often undiagnosed, chronic COPD is on the increase and poses a major public health challenge and burden on healthcare services and society worldwide.

COPD diagnosis

COPD is a chronic and progressive disease associated with an inflammatory response to noxious gases in the airway and lungs.

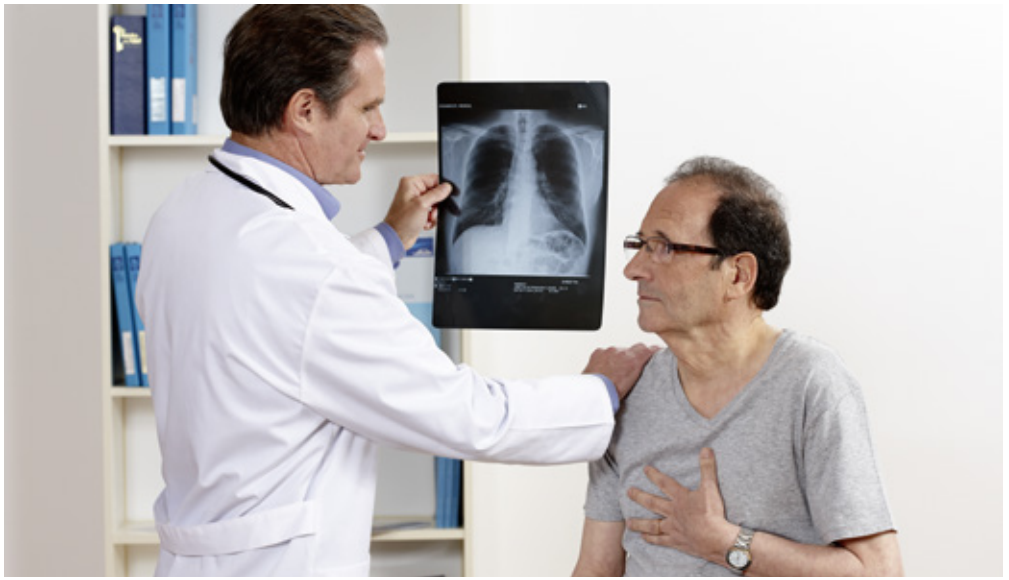
COPD symptoms may include:

- chronic cough (often the first sign of COPD)
- progressive dyspnoea
- chronic sputum production

Spirometry is needed to diagnose COPD and is indicated if these symptoms and a history of exposure to risk factors and one or more comorbidities are present:

- smoking
- exposure to occupational dust or chemicals
- family history
- heart disease
- osteoporosis

The criterion for airflow limitation is a post-bronchodilator fixed ratio of $FEV_1/FVC < 0{,}70$[4].



COPD assessment

Assessment aims to determine the severity of the disease, the impact on the patient's health, and the risk of future events (exacerbations, hospital admission, death).

The following should be assessed:

- Symptoms
- Airflow limitation (using spirometry)
- Risk of exacerbations
- Comorbidities

1. Assessing symptoms
Standard questionnaires such as the COPD Assessment Test (CAT) or the Modified British Medical Research Council (mMRC) should be used to assess symptoms.

2. Airflow limitation
Severity of airflow limitation (based on post bronchodilator FEV_1) in patients with $FEV_1/FVC < 0.70$.

Normal	A normal spirometry reading ($FEV_1/FVC > 0.70$) does not rule out emphysema, chronic bronchitis, asthma, or the risk of developing exacerbations and COPD	
Stage I	Mild	$FEV_1 \geq 80\%$ predicted
Stage II	Moderate	$50\% \leq FEV_1$ 80% predicted
Stage III	Severe	$30\% \leq FEV_1$ 50% predicted
Stage IV	Very severe	$FEV_1 < 30\%$ predicted

Source: Global Initiative for Chronic Obstructive Lung Disease (GOLD)

3. Risk of exacerbations

The risk of frequent exacerbations (more than two per year) can be determined by the history of previous events. The risk increases as airflow limitation worsens.

Patient group A

Low risk, less symptoms
- Typically GOLD I or GOLD II (mild or moderate airflow limitation)
- No exacerbation and no hospitalization for exacerbation
- CAT-score < 10 or mMRC grade 0–1

Patient group B

Low risk, more symptoms
- Typically GOLD I or GOLD II (mild or moderate airflow limitation)
- 0–1 exacerbation per year and no hospitalization for exacerbation
- CAT-score ≥ 10 or mMRC grade ≥ 2

Patient group C

High risk, less symptoms
- Typically GOLD III or GOLD IV (moderate or severe airflow limitation)
- ≥ 2 exacerbation per year or ≥ 1 hospitalization for exacerbation
- CAT-score < 10 or mMRC grade 0–1

Patient group D

High risk, more symptoms
- Typically GOLD III or GOLD IV (moderate or severe airflow limitation)
- ≥ 2 exacerbation per year or ≥ 1 hospitalization for exacerbation
- CAT-score < 10 or mMRC grade ≥ 2

Source: Global Initiative for Chronic Obstructive Lung Disease (GOLD)

4. Comorbidities

A number of comorbidities will increase mortality and the risk of hospitalisation, including
- → cardiovascular disease
- → osteoporosis
- → skeletal muscle dysfunction
- → metabolic syndrome
- → sleep apnoea
- → lung cancer

Patients should be routinely screened for these conditions and appropriate treatment given.

COPD therapeutic options

As well as appropriate pharmacological therapies, **smoking cessation**, **physical activity** and **vaccinations** for influenza and other conditions, the following non-pharmacological therapies can improve patient outcomes and ensure healthcare resources are focused effectively.

Pulmonary rehabilitation can be beneficial at all stages of COPD and can improve exercise tolerance, dyspnea and fatigue[5].

Long term oxygen therapy (LTOT) (>15 hours per day) has been shown to increase survival in patients with severe, resting hypoxemia[6]. Indications for LTOT are[2]:

- → PaO_2 at or below 7.3kPa (55mmHg) or SaO_2 at or below 88% with or without hypercapnia confirmed twice over a three week period; or
- → PaO_2 between 7.3 kPa (55mmHg) and 8.0 kPa (60 mmHg), or SaO_2 of 88%, if there is evidence of pulmonary hypertension, peripheral edema suggesting congestive cardiac failure or polycythemia (haematocrit > 55%)

Non-Invasive Positive Pressure Ventilation (NPPV) combined with LTOT has been proven to improve survival, lung function and quality of life in patients with severe, stable hypercapnic COPD[7].

Airway Clearance in the form of High Frequency Chest Wall Oscillation (HFCWO) or Cough Assist therapy can support sputum and cough clearance[8].

How can Linde help?

Linde Homecare operates in 41 countries around the globe and serves around 1.6 million patients. We work in partnership with respiratory consultants to provide a single point of call for homecare support for patients with COPD, including equipment, education, follow-up and compliance. Our services ensure continuity of long term care, helping optimise patient outcomes, while enabling clinicians to focus resources as efficiently as possible.

<Countries to add own independent validation eg customer surveys>

More information:
For more detailed information download our COPD/LTOT app at www.xxxx

[1] World Health Organization: Chronic Respiratory Diseases. http://www.who.int/gard/publications/chronic_respiratory _diseases.pdf
[2] World Health Organization: The global burden of disease. 2004 UPDATE http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004update_full.pdf
[3] Stoller JK et al. Long-term Oxygen Treatment Trial Research Group. Oxygen therapy for patients with COPD: current evidence and the long-term oxygen treatment trial. Chest. 2010; 138(1):179-87
[4] Global Initiative for Chronic Obstructive Lung Disease (GOLD): Pocket guide to COPD diagnosis, management and prevention. www.goldcopd.org
[5] Nishimura K, Izumi T, Tsukino M, Oga T. Dyspnea is a better predictor of 5-year survival than airway obstruction in patients with COPD. Chest 2002;121:1434–1440.
[6] UK Medical Research Council (MRC) trial.
[7] Non-invasive positive pressure ventilation for the treatment of severe stable chronic obstructive pulmonary disease: a prospective, multicentre, randomised, controlled clinical trial, Thomas Köhnlein, et al. The Lancet Respiratory Medicine, Volume 2, Issue 9, September 2014, Pages 698-705 http://www.sciencedirect.com/science/article/pii/S2213260014701535.
[8] At home and on demand mechanical cough assistance program for patients with amyotrophic lateral sclerosis. Vitacca M. et al, May 2010 http://www.ncbi.nlm.nih.gov/pubmed/20407305

Linde Healthcare in homecare.

Linde Healthcare is a homecare partner trusted by prescribers in more than 40 countries worldwide. We are dedicated to using proven therapies to secure the best possible patient outcomes. We work closely with prescribers, payers and patients to ensure continuity of care. Our medical knowledge and technical capabilities enable us to provide competent support at every stage – from diagnosis and planning to ongoing services, patient education and follow-up.

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