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Admission Guidelines For Patients With Chronic Obstructive Pulmonary Disease In Hong Kong

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Summary

Chronic obstructive pulmonary disease (COPD) is a common condition in Hong Kong and many affected patients require frequent admissions to hospital. The indications for hospitalisation for Chinese COPD patients have not been described for the Hong Kong setting. We have therefore compiled these criteria which artificially divide the admission process into acute, sub-acute, and elective. Patients should be immediately hospitalised if there is an exacerbation complicated by severe dyspnoea or respiratory failure. Sub-acute admission is indicated for stabilisation of severe COPD complications and elective admission is indicated for long term treatment rationalisation. (*HK Pract* 1998; 20:195-200)

摘要

慢性阻塞性肺病是本港一種常見疾病，病人常需入院接受治療。目前香港中國籍患者入院指徵尚無明確標準，故此本文人為地將其分為急性、亞急性和選擇性入院指徵加以闡述。急性入院指徵指患者病情惡化伴有嚴重氣促或呼吸衰竭需立即入院；亞急性則指患者因為治療嚴重的併發症入院；選擇性則指長期接受治療的病人入院以調整治療方案。

Definitions and the size of the problem

Chronic obstructive pulmonary disease (COPD) is defined as "a disorder characterized by reduced maximal expiratory flow and slow forced emptying of the lungs; features which do not change over several months". The airflow limitation due to varying combinations of airway disease and emphysema, is often progressive and usually has minimal "reversibility" with bronchodilator therapy.[1] The term COPD describes the frequently encountered syndrome of a combination of features of chronic bronchitis and emphysema, which almost always co-exist in the same patient. Chronic bronchitis is defined as the presence of productive cough for 3 months a year for at least 2 years with no other identifiable aetiology. Emphysema is defined pathologically as irreversible destructive enlargement of air space distal to the terminal

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bronchioles without significant fibrosis.

Epidemiological studies have demonstrated an undoubted correlation between increases in the population's smoking rate and its development of disability from COPD some 30 years later.[2,3] This is applicable to the Hong Kong situation as there was an upsurge in cigarette smoking back in the 1950s and 1960s. COPD is a leading cause of morbidity and mortality in the adult population world-wide and affects 6% and 3% of the male and female population in the United States respectively.[4] COPD also causes significant morbidity and mortality in Hong Kong. According to the in-patient statistics in 1994, COPD was the cause of more than 30,000 admissions into Hospital Authority (HA) hospitals and constituted more than 3% of all hospital admissions. Two thirds of these patients were re-admitted 1 to 5 times within the next 6 months.

The "revolving door" phenomenon

Currently many COPD sufferers are being frequently re-admitted to hospitals for treatment of exacerbations. This "revolving door" phenomenon is characterized by high admission and re-admission rates. Intrinsic problems with delivery of the medical service, together with inadequate aftercare in part due to poor home and social support, and poor patient education have also contributed to high morbidity and mortality rates in COPD.

HA has chosen chronic lung disease to be a priority health target, aiming to reduce the mortality rate of COPD patients by 10-15% and their hospital admission rates by 20% by the year 2000. Members of the Hong Kong Thoracic Society, American College of Chest Physicians (Hong Kong and Macau Chapter), and HA consultants have arrived at a consensus on this issue.

Pathogenic components of COPD exacerbations

A large number of conditions might lead to acute exacerbations in COPD, including infection of the tracheobronchial tree, pneumonia, heart failure, pulmonary embolism, pneumothorax, inappropriate oxygen administration, metabolic diseases such as diabetes mellitus, inappropriate use of drugs (e.g. hypnotics, diuretics, tranquilizers), poor nutritional status, and exacerbations of other systemic diseases.[1] It is beyond the scope of this article to discuss the pathogenesis, aetiology, complications, and treatment of COPD exacerbations. Salient points have, however, been outlined in **Table 1**.

The need for admission guidelines

Practical guidelines have appeared in all medical specialties and for many common diseases, but some physicians find them difficult to accept, as many guidelines are rigid and sometimes non-scientifically based, particularly as evidence-based medicine is only a relatively recent concept. Although COPD is a very common cause of hospital admission in Hong Kong and world-wide, indications for admission have received little attention until very recently.[1,5-7] So far, emergency admissions have attracted the most attention. Such evaluation must include making an accurate diagnosis through thorough history taking, physical examination, laboratory and bed side investigations, with due reference to the patient's pre-existing records. The value of admission guidelines lies in their ability to differentiate between the patients who require in-patient from those who need only out-patient or emergency room (ER) care.

Four major English language guidelines have been published, with emphasis on different aspects of the acute and chronic phases of COPD management. Expert subcommittees of the American Thoracic,[5] Canadian Thoracic,[8] Australian and New Zealand Thoracic,[9] and the European Respiratory Societies[1] have deliberated in detail on the global management of patients with COPD, including some indications for hospitalisation. These have been modified to suit the Hong Kong setting as outlined in **Table 2**.

Although the adverse prognostic and risk factors in patients with community-acquired pneumonia such as hypoxia, multi-lobar involvement, renal impairment etc., have been firmly established, similar data on COPD exacerbations are relatively scarce.[10-13] Knowledge of such risk factors is obviously very important in identifying patients who suffer from "high risk exacerbations" and therefore need early hospitalization. Due to a lack of local or regional data, the task of

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constructing these admission guidelines was a difficult one, and was less evidence-based than we desired. A recent small study performed on male American patients, so far unvalidated in female patients nor in Hong Kong, has identified patient profiles that indicate a need for in-patient care rather than ER treatment. These include: previous ER visits within one week, the number of doses of nebulised bronchodilators required in ER, usage of long-term oxygen or theophylline, and previous relapse rate.[14] Another study concluded that the presence of old age, $P_{A-a}O_2 > 41$ mmHg, atrial fibrillation, or ventricular arrhythmias was associated with increased mortality in acute COPD exacerbations.[15]

As soon as a decision of not providing in-patient care to a patient has been made, an acceptable out-patient management plan must follow. In addition, it should be emphasised that many patients fall ill in a multifaceted manner, and may also have de-stabilisation of other pre-existing or newly developed illnesses which also require treatment in their own right (**Table 1**). The guidelines must therefore be interpreted flexibly with due consideration of the severity of the underlying illness, coexisting diseases, progression of symptoms, response to out-patient-based therapy, and other confounding factors such as socio-economic considerations.

Table 1: Some possible pathogenic components in acute COPD exacerbations

Component	Acute treatment
Tracheobronchial infection (Usually by viruses, *Haemophilus influenzae*, or *Streptococcus pneumoniae*)	Antibiotics (e.g. amoxycillin-clavulanic acid 750 mg t.i.d.; erythromycin 500 mg q.i.d. etc.)
Airflow obstruction	Bronchodilator (e.g. nebulised salbutamol 5 mg q.i.d. and ipratropium 500 mcg q.i.d.) * Theophylline (e.g. slow release theophylline 200-300 mg b.i.d.) * Oral β_2 agonists (e.g. salbutamol 8 mg b.i.d.) Systemic corticosteroid therapy (e.g. prednisolone 30-40 mg o.d.)
Sputum retention or ineffective coughing	In-patient physiotherapy
Complications • Respiratory failure • Cor pulmonale • Pneumothorax • Pneumonia • Cardiac arrhythmias • De-stabilization of systemic diseases e.g. diabetes mellitus, ischaemic heart disease, cerebral vascular disease • Septicaemia • Iatrogenic including adverse drug reactions, inappropriate oxygen therapy, steriod-induced osteoporosis	

* *Avoid concomitant administration*

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Interpretation of The COPD Admission Guidelines (Table 2)

Admissions are classified as acute (immediate), sub-acute (within days) and elective (within weeks). Indications for hospitalisation of associated pulmonary diseases, e.g. pneumothorax, pneumonia and bronchial carcinoma etc., will not be discussed here. It is important to appreciate that these guidelines are by no means comprehensive, nor is there any evidence that their application will definitely improve the quality of patient care, morbidity, mortality, or other outcome parameters. Benefits of having such guidelines could however include: enhancement of accurate patient assessment, reduction of unnecessary admission for some patients, and better deployment of resources to out-patient and other appropriate in-patient services.

After initial admission, some COPD patients fail to stabilise despite maximal medical and oxygen therapy and might require high dependency (HDU) or intensive care unit (ICU) admission. Whilst the British and American views differ on the appropriateness of providing intense treatment to patients who have severe pre-morbid disease, many such patients are often treated aggressively in Hong Kong. It is uncertain whether or not prolonged treatment of such intensity for many severely disabled patients results in favourable outcome in terms of survival and quality of life. A modified version of the American Thoracic Society guidelines for HDU/ICU admission is outlined in **Table 3**.[5] It must be emphasised to the patient, his family and the critical care physician that ventilation and other

Table 2: Indications for hospitalisation of COPD patients

Acute admission (immediate)

Acute exacerbation (manifests as increased cough, dyspnoea, sputum production) and the presence of any of the following:

- Poor response to out-patient therapy
- Significant reduction in exercise tolerance
- Inability to eat or sleep due to dyspnoea
- Repeated choking on eating or drinking due to dyspnoea
- Inability to manage at home and alternative home supporting care not immediately available
- Significant co-morbid conditions whether respiratory (e.g. pneumothorax) or not (e.g. unstable diabetes mellitus)
- Respiratory failure (either deterioration of pre-existing or newly developed) – type I or II
- Mental disturbances such as confusion or disorientation
- Worsening or recent onset cor pulmonale

Sub-acute admission (within days of onset or presentation to out-patient or accident & emergency departments)

- Poor response to out-patient therapy
- Worsening or recent onset cor pulmonale
- Co-morbid conditions such as steroid-induced myopathy, or acute vertebral compression fractures or rib fracture which worsen lung function

Elective admission (within weeks of onset or presentation to out-patient or accident & emergency departments)

- Invasive diagnostic procedures that might worsen lung function or symptoms
- Assessment for long term oxygen therapy
- Early phases of pulmonary rehabilitation
- Need for rationalisation of therapy

Table 3: Indications for HDU/ICU admission in COPD patients who have satisfactory pre-morbid state

1. Persistent or worsening hypoxaemia despite supplementary oxygen or severe/ worsening respiratory acidosis (pH < 7.30)
2. Confusion, lethargy, or respiratory muscle fatigue
3. Requirement of assisted ventilation (whether invasive or non-invasive)
4. Severe dyspnoea which does not respond or responds poorly to initial emergency therapy

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Key messages

1. Chronic obstructive pulmonary disease is a very common condition leading to hospital admission in Hong Kong.
2. Acute and immediate admission should be offered to patients who are in acute exacerbation who have poor response to out-patient treatment, respiratory failure, mental disturbance, progressive dyspnoea, worsening or new cor pumonale or inability to cope at home.
3. Sub-acute admission should be offered to out-patients within days of onset of poor response to treatment, cor pulmonale, or in the presence of a co-morbid condition.
4. Elective admission should be offered to out-patients within weeks for invasive diagnostic procedures, assessment of home oxygen therapy, rehabilitation, or rationalisation of therapy.
5. The indications for intensive care unit admission for COPD patients are also outlined.

modes of intensive therapy do not cure or reverse the pre-existing damages in COPD, and therefore only patients with satisfactory pre-morbid condition and significant reversible element(s) should be offered HDU/ICU therapy. Prolonged suffering for both the patient and his family, erosion of staff morale, and mal-allocation of resources would be the consequences if this important principle is not recognised and adhered to.

Conclusions

The obvious long-term strategy to lower the incidence of COPD is to reduce smoking through research, taxation, legislation, education, and de-marketing.[16] Smoking cessation decreases the degree of lung function impairment and delays disability and death in COPD, as well as preventing the development of other major causes of mortality and morbidity, e.g. bronchial carcinoma, ischaemic heart disease, and cerebrovascular disease.

In the short and medium terms, improvement in the outcome of COPD patients largely depends on the provision of optimal care in both the hospital and the community. Long-term domiciliary oxygen therapy improves survival, exercise performance, and activities of daily living in selected patients,[17] and is already widely practised in Hong Kong. Further strategies have to be developed towards the better management of this disease. Issues such as patient education, coordination and integration of acute and non-acute services and in-patient and out-patient treatment programs of rehabilitation, establishment of clinical guidelines and standards of care have all been considered. The Society and the College have collated these views towards future recommendations, and have decided to publish the current guidelines regarding hospitalisation of COPD patients. It is hoped that these guidelines would help streamline care as soon as possible after diagnosis and on presentation of acute symptoms, whilst perhaps reducing unnecessary hospitalisation of these patients.

As the outlined criteria are applied and validated, we should study their impact on the morbidity and mortality, and identify further risk factors and information that would help manage COPD patients. ■

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